

Appendix C

The Test-Curriculum Matching Analysis: Mathematics

TIMSS went to great lengths to ensure that comparisons of student achievement across countries would be as fair and equitable as possible. The *TIMSS 2007 Assessment Frameworks* were designed to specify the important aspects of mathematics that participating countries agreed should be the focus of an international assessment of mathematics achievement, and the assessment items were developed through a collaborative process with national representatives to faithfully represent the specifications in the frameworks and field tested extensively in participating countries. Finalizing the TIMSS 2007 assessments involved a series of reviews by representatives of the participating countries, experts in mathematics, and testing specialists. At the end of this process, the National Research Coordinators from each country formally approved the TIMSS 2007 assessments, thus accepting them as being sufficiently fair to compare their students' mathematics achievement with that of students from other countries.

Although the assessments were developed to represent an agreed-upon framework and were intended to have as much in common across countries as possible, it was unavoidable that the match between the TIMSS 2007 assessment (or test) and the mathematics curriculum would not be the same in all countries. To restrict test items to just those topics included in the curricula of all participating countries and covered in the same sequence would severely limit test coverage and restrict the research questions that the

study is designed to address. The tests, therefore, inevitably have some items measuring topics unfamiliar to some students in some countries.

The Test-Curriculum Matching Analysis (TCMA) was conducted to investigate the extent to which the TIMSS 2007 mathematics assessment was relevant to each country's curriculum. The TCMA also investigates the impact on a country's performance of including only achievement items that were judged to be relevant to its own curriculum.¹

To gather data about the extent to which the TIMSS 2007 tests were relevant to the curricula of the TIMSS countries and benchmarking participants, national coordinators were asked to examine each achievement item and indicate whether the item was in their country's intended curriculum at the grade tested (fourth or eighth grade). The national coordinator was asked to choose persons very familiar with the curriculum at these grades to make this determination. In some countries, the curriculum was prescribed for a range of grades and was not explicit about what was to be covered by the end of fourth or eighth grades. For example, in Sweden the curriculum specifies the curricular goals to be achieved by the end of the fifth and ninth grades, but does not provide a grade by grade specification. In such situations, coordinators were asked to make the best judgment possible.² Since an item might be in the curriculum for some but not all students in a country, coordinators were asked to consider an item included if it was in the intended curriculum for more than 50 percent of the students. All TIMSS 2007 participants took part in the TCMA analysis except Algeria, Armenia, El Salvador, Kuwait, Latvia, Lithuania, and the Ukraine at fourth grade and Algeria, Armenia, Bulgaria, El Salvador, Kuwait, Lithuania, Saudi Arabia, and the Ukraine at eighth grade.

Exhibits C.1 and C.2 present the TCMA results for the TIMSS 2007 mathematics test at fourth and eighth grades. Exhibit C.1 shows the average percent correct on the mathematics items judged appropriate by each country. Exhibit C.2 shows the standard errors corresponding to the percentages presented in Exhibit C.1.

In Exhibit C.1, the bottom row of the exhibit shows the number of items, in terms of score points, identified as appropriate in each country. At the

1 Because there may also be curriculum areas covered in some countries that are not covered by the TIMSS 2007 tests, the TCMA does not provide complete information about how well the tests cover the curricula of the countries.

2 Exhibit 5 of the *TIMSS 2007 Encyclopedia* provides information on the grade-to-grade structure of the curriculum for each TIMSS 2007 participant.

fourth grade, the maximum number of score points in the assessment was 188 points.³ Generally, the proportion of items judged appropriate was fairly high. Reading along the bottom row, it can be seen that 19 of the 29 countries and 5 of the 7 benchmarking participants that took part in the TCMA analysis judged 75 percent or more (141 score points) to be appropriate. Only four participants—the Russian Federation, the Slovak Republic, Tunisia, and Yemen—judged half of the mathematics items or less to be included in their curricula.

At the eighth grade, the percentage of items judged appropriate was somewhat higher; with 8 of the 41 countries and 2 of the 7 benchmarking participants that took part in the TCMA analysis accepting 100 percent of the items (all 236 score points) and an additional 29 countries and 5 benchmarking participants accepting 75 percent or more (177 score points). For all participants, the majority of eighth grade mathematics was judged to be appropriate to their curricula.

Since most countries indicated that at least some items were not included in their intended curriculum at the grade tested, the data were analyzed to determine whether the inclusion of these items had any effect on the international performance comparisons.⁴

The first column of data in Exhibit C.1 shows the average percent correct on all test items for each participant, together with its standard error. Subsequent columns show the performance of each participant on those items judged appropriate by the participant listed at the head of the column. Participants are presented in order of their performance based on average percent correct on all items, from highest to lowest. To interpret this exhibit, choosing a country and reading across its row provides the average percent correct for the students in that country on the items selected by each of the countries listed along the top of the exhibit. For example, at the fourth grade, Hong Kong SAR, where the average percent correct was 78 percent on its own set of items, had 77 percent correct on the items selected by Singapore, 78 percent on the items selected by Chinese Taipei, 77 percent on the items selected by Japan, and so forth. The column for a country listed at the top shows how each of the other participants performed

3 The TIMSS 2007 fourth grade mathematics assessment contained 179 items yielding 192 score points. However, following item review, some items were deleted and response categories were combined for a number of items, resulting in data for reporting on 177 items and 188 score points. Similarly, following item review, the 215 items and 238 score points in the eighth grade assessment were reduced to 214 items and 236 score points.

4 It should be noted that the mathematics achievement presented in Exhibit C.1 is based on average percent correct, which is different from the average scale scores that are presented in Chapter 1.

on the set of items selected as appropriate for that country's students. Using the set of items selected by the Netherlands as an example, 79 percent of these items, on average, were answered correctly by students in Hong Kong SAR, 76 percent by students in Singapore, 72 percent by students in Chinese Taipei, 69 percent by students in Japan, 65 percent by those in Kazakhstan, and so forth. The shaded diagonal element in the exhibit shows how each country performed on the set of items that it selected based on its own curriculum. Thus, students from the Netherlands averaged 62 percent correct on the set of items identified by the Netherlands for the analysis.

For each country's selected items, the international averages across participating countries are presented in the lower part of the exhibit. These show that the selections of items by the participating countries varied somewhat in average difficulty, ranging at the fourth grade from 49 percent correct, for several participants, to 54 percent correct for those chosen by the Russian Federation. At the eighth grade, the average percent correct ranged from 40 percent, for many participants, to 43 percent for those chosen by Scotland.

Comparing the diagonal element for a country with the overall average percent correct shows the difference between performance on the set of items chosen as appropriate for that country and performance on the test as a whole. In general, countries performed better on their own item sets than on the items overall, although not by much. To illustrate, the average percent correct for Hong Kong SAR across all fourth-grade mathematics items was 77 percent. The diagonal element shows that students from Hong Kong had a slightly greater average percent correct (78 percent) across the set of items selected as appropriate for Hong Kong than they did overall. Almost all participants had a difference of one or two percentage points between the two performance measures, with the largest differences in the Russian Federation (11 percentage points), Tunisia and the province of Alberta (6 percentage points), and Austria and the Slovak Republic (5 percentage points). At the eighth grade, the differences were generally less; the largest being in Scotland (7 percentage points), and Malaysia and the Russian Federation (3 percentage points).

It is clear that the selection of items does not have a major effect on the relative performance among TIMSS participants. Participants that had relatively high or low performance across all the mathematics items also had relatively high or low performance on each of the various sets of items selected for the TCMA. For example, at the fourth grade, Hong Kong SAR had the highest average percent correct not only on the test as a whole, but also on all of the different item selections, with Singapore, Chinese Taipei, and Japan next in order of performance on practically all selections of items. Although there are some changes in the ordering of countries based on the items selected for the TCMA, most of these differences are within the boundaries of sampling error.⁵

Even when countries performed better on the items judged by them to be included in their curriculum than they did overall, their performance relative to other participants was little changed. As an example, consider the 68 score points selected by the Russian Federation at the fourth grade. The students in the Russian Federation did better on these items (73% correct) than on the test as a whole (62% correct). However, most other countries also did better on these particular items, with an international average of 54 percent correct compared with 49 percent correct overall. The countries that performed better than the Russian Federation on the overall test also performed as well or better on the items selected by the Russian Federation.

The TCMA results provide evidence that the TIMSS 2007 mathematics assessment provides a reasonable basis for comparing achievement of the participating countries and benchmarking entities. This result is not unexpected, since making the assessment as fair as possible was a major consideration in test development. The fact that the majority of countries indicated that most items were appropriate for their students means that the different average percent correct estimates were based on many of the same items. Insofar as countries rejected items that would be difficult for their students, these items tended to be difficult for students in other countries as well. The analysis shows that omitting such items tends to improve the results for that country, but also tends to improve the results for all other countries, so that the overall pattern of relative performance is largely unaffected.

5 Small differences in performance between adjacent countries shown in this exhibit usually are not statistically significant. The standard errors for the average percent correct statistics based on the TIMSS 2007 sample are provided in Exhibit C.2. For any sample average shown in Exhibit C.1, it can be said with 95 percent confidence that the corresponding value in the population falls between the sample estimate plus or minus two standard errors.

Exhibit C.1 Average Percent Correct for Test-Curriculum Matching Analysis – Mathematics

TIMSS2007
Mathematics **4th**
Grade

Based on Subset of Items Specially Identified by Each Country as Addressing its Curriculum (See Exhibit C.2 for corresponding standard errors)

Instructions: Read **across** the row to compare that country's performance based on the test items included by each of the countries across the top. Read **down** the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the **diagonal** to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Hong Kong SAR	Singapore	Chinese Taipei	Japan	Kazakhstan	Russian Federation	England	Netherlands	United States	Germany	Denmark	Australia	Hungary	Italy	Austria	Slovenia	Sweden	Slovak Republic	Scotland	New Zealand	Czech Republic	Norway	Georgia	Iran, Islamic Rep. of	Colombia	Morocco	Tunisia	
Hong Kong SAR	77 (0.7)	78	77	78	77	75	80	77	79	77	77	77	78	78	76	79	78	77	76	78	77	76	77	76	78	77	77	76	
Singapore	74 (0.8)	75	75	76	75	73	78	74	76	75	74	74	75	74	74	76	74	74	73	76	74	73	74	74	74	74	75	74	
Chinese Taipei	69 (0.4)	68	68	73	73	69	77	69	72	70	69	69	71	70	70	71	70	71	69	73	70	67	69	71	69	69	69	70	
Japan	67 (0.5)	66	66	70	70	67	72	67	69	67	68	68	69	68	68	68	69	69	66	70	68	66	68	68	67	67	68	67	
Kazakhstan	64 (1.7)	63	64	66	65	65	72	64	65	64	65	64	65	65	64	67	65	64	66	66	64	64	65	65	64	67	67	67	
Russian Federation	62 (1.1)	62	61	64	65	64	73	62	64	63	64	63	63	64	62	66	64	63	66	66	62	62	62	65	64	62	65	67	
England	61 (0.7)	61	61	63	61	59	62	61	63	62	62	62	63	62	60	64	63	62	58	64	63	60	62	62	62	61	62	59	
Netherlands	59 (0.5)	58	58	62	61	58	61	59	62	59	59	59	61	60	60	61	60	61	58	62	60	58	59	61	58	59	59	59	
United States	59 (0.6)	58	58	61	59	57	62	59	60	59	59	59	60	60	58	62	60	59	57	61	60	57	59	59	59	59	60	57	
Germany	57 (0.5)	56	56	59	58	58	62	57	60	58	60	58	59	59	57	62	61	58	56	60	59	57	58	60	57	60	59	59	
Denmark	57 (0.7)	56	56	58	57	55	57	57	58	57	57	58	58	58	56	59	59	58	54	59	58	56	57	58	56	57	58	55	
Australia	55 (0.8)	54	54	58	55	53	55	55	57	55	56	56	57	56	54	57	57	56	52	58	57	54	56	55	56	55	55	52	
Hungary	54 (0.8)	53	54	56	56	56	61	54	56	54	57	55	55	56	54	59	57	55	57	58	55	55	54	57	56	54	56	57	
Italy	53 (0.8)	51	52	55	54	52	57	53	54	53	54	54	53	54	52	56	54	53	52	55	54	52	53	53	53	53	56	53	
Austria	52 (0.5)	50	51	55	53	53	60	52	54	52	54	52	53	53	52	57	55	53	52	55	53	52	52	55	52	53	55	53	
Slovenia	52 (0.4)	51	51	54	52	52	57	52	54	52	55	53	53	54	51	57	56	53	52	55	54	52	52	54	53	52	53	53	
Sweden	51 (0.6)	50	49	54	53	51	55	51	53	51	53	52	53	52	51	53	54	54	51	55	53	50	51	54	49	51	52	52	
Slovak Republic	50 (0.9)	50	50	53	53	53	61	50	52	51	53	51	51	52	51	56	53	52	55	55	51	51	51	54	52	50	53	56	
Scotland	50 (0.6)	49	49	52	50	48	52	50	52	50	51	51	51	51	49	53	52	51	47	54	52	49	51	51	50	50	50	48	
New Zealand	49 (0.5)	48	48	51	49	47	49	49	51	49	50	50	51	50	48	51	52	50	46	52	51	49	50	50	49	49	49	46	
Czech Republic	47 (0.7)	46	46	50	49	50	57	47	50	47	51	48	49	49	47	53	51	49	50	52	48	48	48	51	48	47	51	53	
Norway	44 (0.6)	43	43	47	45	44	48	44	46	44	46	45	46	46	44	47	47	46	43	48	46	44	45	46	44	44	46	45	
Georgia	38 (0.9)	38	38	40	41	41	50	38	40	39	40	38	39	39	38	43	39	39	43	42	38	39	38	41	41	38	41	45	
Iran, Islamic Rep. of	30 (0.6)	30	30	32	31	32	38	30	32	31	32	31	32	32	30	35	32	31	32	33	32	31	31	31	33	30	34	34	
Colombia	23 (0.7)	22	22	24	24	23	27	23	24	23	24	23	23	24	23	25	24	23	23	25	23	22	23	24	23	23	24	25	
Morocco	23 (0.7)	21	22	23	22	23	26	22	23	23	24	23	23	23	22	26	23	22	23	23	23	23	23	23	24	23	26	25	
Tunisia	21 (0.5)	21	21	23	23	24	30	21	22	22	23	22	22	22	22	25	22	22	24	23	21	22	21	23	23	21	24	27	
Qatar	18 (0.1)	17	17	19	18	18	20	18	19	18	18	18	18	18	18	20	18	18	18	19	18	17	17	18	19	18	18	19	
Yemen	14 (0.4)	13	14	15	14	15	16	14	14	14	13	14	14	14	14	15	14	14	14	14	14	14	14	14	15	14	14	15	
International Avg.	49 (0.1)	49	49	51	50	50	54	49	51	50	51	50	50	50	49	53	51	50	49	52	50	49	50	51	50	49	51	51	
Benchmarking Participants																													
Massachusetts, US	69 (0.8)	69	69	71	70	68	72	69	71	70	69	70	70	70	69	72	71	70	68	71	70	68	69	69	71	69	70	68	
Minnesota, US	65 (1.3)	64	65	67	65	63	67	65	66	65	64	65	66	65	64	67	66	65	62	67	66	63	65	65	66	65	66	62	
Quebec, Canada	55 (0.8)	55	55	58	57	55	58	56	57	56	56	56	57	57	55	58	58	57	55	58	58	54	56	57	56	55	56	55	
Ontario, Canada	54 (0.7)	53	53	56	54	52	54	54	56	55	55	55	56	56	53	57	57	55	50	57	57	53	55	54	54	54	55	51	
Alberta, Canada	52 (0.7)	51	51	54	53	50	53	52	54	52	53	53	54	54	51	54	54	53	49	55	54	50	52	53	51	52	52	50	
British Columbia, Canada	52 (0.7)	51	51	54	53	50	54	52	53	52	53	53	53	53	52	54	54	53	50	55	54	51	52	53	51	52	52	51	
Dubai, UAE	39 (0.4)	39	39	41	40	38	43	39	40	40	40	39	40	40	39	41	40	39	38	41	40	38	39	40	39	39	40	40	
Number of Items (Score Points) Identified*	188	144	165	146	126	130	68	184	152	174	142	173	165	169	172	116	159	166	94	127	162	153	179	142	140	188	109	84	

SOURCE: IEAs Trends in International Mathematics and Science Study (TIMSS) 2007

* Of the 179 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 192 total score points. Following item review, some

items were deleted and response categories were combined for a number of items, resulting in 177 items and 188 score points.

Exhibit C.1 Average Percent Correct for Test-Curriculum Matching Analysis – Mathematics (Continued)

TIMSS2007
Mathematics **4th**
Grade

Based on Subset of Items Specially Identified by Each Country as Addressing its Curriculum (See Exhibit C.2 for corresponding standard errors)

Instructions: Read **across** the row to compare that country's performance based on the test items included by each of the countries across the top. Read **down** the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the **diagonal** to compare performance for each different country based on its own decisions about the test items to include.

		Benchmarking Participants								Average Percent Correct on All Items	Country
Qatar	Yemen	Massachusetts, US	Minnesota, US	Quebec, Canada	Ontario, Canada	Alberta, Canada	British Columbia, Canada	Dubai, UAE			
77	80	77	77	77	77	78	77	77	77	(0.7)	Hong Kong SAR
75	80	74	74	75	74	75	74	74	74	(0.8)	Singapore
70	76	69	68	69	69	71	69	69	69	(0.4)	Chinese Taipei
67	71	67	67	68	68	70	69	67	67	(0.5)	Japan
64	70	64	64	65	64	65	63	64	64	(1.7)	Kazakhstan
62	67	62	63	63	62	65	63	62	62	(1.1)	Russian Federation
61	62	61	62	62	63	66	63	61	61	(0.7)	England
59	61	59	59	59	60	63	59	59	59	(0.5)	Netherlands
59	63	59	59	59	59	62	60	59	59	(0.6)	United States
58	57	57	58	59	58	62	59	57	57	(0.5)	Germany
57	55	57	57	58	58	61	58	57	57	(0.7)	Denmark
55	55	55	55	56	57	60	57	55	55	(0.8)	Australia
54	57	54	55	55	55	57	55	54	54	(0.8)	Hungary
53	56	53	53	54	53	56	54	53	53	(0.8)	Italy
52	55	52	52	53	52	56	53	52	52	(0.5)	Austria
52	52	52	53	54	54	57	55	52	52	(0.4)	Slovenia
51	50	51	52	52	53	56	53	51	51	(0.6)	Sweden
50	54	50	51	52	51	54	51	50	50	(0.9)	Slovak Republic
50	50	50	50	51	52	55	53	50	50	(0.6)	Scotland
49	49	49	50	50	51	54	51	49	49	(0.5)	New Zealand
47	49	47	48	49	48	52	49	47	47	(0.7)	Czech Republic
44	44	44	45	45	46	49	46	44	44	(0.6)	Norway
38	47	38	38	39	38	40	38	38	38	(0.9)	Georgia
30	35	30	31	31	31	33	32	30	30	(0.6)	Iran, Islamic Rep. of
23	24	23	23	24	23	25	23	23	23	(0.7)	Colombia
23	25	23	22	23	23	24	23	23	23	(0.7)	Morocco
21	26	21	21	22	21	23	22	21	21	(0.5)	Tunisia
18	20	18	18	18	18	19	18	18	18	(0.1)	Qatar
14	17	14	14	14	14	14	13	14	14	(0.4)	Yemen
49	52	49	50	50	50	53	50	49	49	(0.1)	International Avg.
Benchmarking Participants											
70	73	69	69	70	70	72	70	69	69	(0.8)	Massachusetts, US
65	68	65	65	65	66	68	66	65	65	(1.3)	Minnesota, US
56	58	55	56	57	57	60	58	55	55	(0.8)	Quebec, Canada
54	52	54	55	55	56	60	58	54	54	(0.7)	Ontario, Canada
52	51	52	52	53	54	58	55	52	52	(0.7)	Alberta, Canada
52	52	52	52	53	53	57	55	52	52	(0.7)	British Columbia, Canada
39	42	39	39	40	39	42	40	39	39	(0.4)	Dubai, UAE
178	73	188	174	165	157	140	134	188	188		Number of Items (Score Points) Identified*

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

() Standard errors appear in parentheses.

Exhibit C.1 Average Percent Correct for Test-Curriculum Matching Analysis – Mathematics (Continued)

TIMSS2007
Mathematics 8th
Grade

Based on Subset of Items Specially Identified by Each Country as Addressing its Curriculum (See Exhibit C.2 for corresponding standard errors)

Instructions: Read **across** the row to compare that country's performance based on the test items included by each of the countries across the top. Read **down** the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the **diagonal** to compare performance for each different country based on its own decisions about the test items to include.

Iran, Islamic Rep. of		Egypt	Bahrain	Indonesia	Syrian Arab Republic	Palestinian Nat'l Auth.	Oman	Morocco	Colombia	Botswana	Qatar	Ghana	Country	Benchmarking Participants					
														Massachusetts, US	Average Percent Correct on All Items				
71	72	71	71	72	71	71	71	71	71	73	71	73	71	71	71	71 (0.5)	Korea, Rep. of		
71	71	71	71	72	71	71	71	71	71	74	71	72	71	71	71	71	71 (1.0)	Chinese Taipei	
71	71	71	70	71	71	71	72	70	74	70	72	72	70	70	70	70 (0.9)	Singapore		
66	66	66	66	67	66	66	66	66	66	69	66	68	66	66	66	66 (1.3)	Hong Kong SAR		
65	66	66	66	66	66	66	66	66	66	68	66	67	66	65	66	66 (0.5)	Japan		
52	53	52	53	53	52	53	54	53	55	53	55	55	53	52	53	53 (0.8)	Hungary		
51	53	52	52	52	52	53	54	52	54	52	53	53	52	52	52	52 (1.2)	England		
51	51	51	52	51	52	51	51	50	51	54	51	54	51	51	51	51 (1.0)	Russian Federation		
49	51	50	50	51	50	51	51	50	53	50	51	51	50	50	50	50 (0.7)	United States		
48	50	49	49	49	49	50	51	49	51	49	51	49	49	49	49	49 (0.6)	Czech Republic		
47	48	48	48	49	48	49	49	48	50	48	50	48	48	48	48	48 (0.5)	Slovenia		
46	48	47	47	47	47	48	49	47	49	47	48	48	47	47	47	47 (0.9)	Australia		
46	47	46	46	47	46	47	48	46	50	46	49	46	46	46	46	46 (0.2)	Malta		
44	46	45	46	46	46	47	49	46	47	46	47	46	46	46	46	46 (0.5)	Sweden		
44	46	45	45	45	45	46	47	45	47	45	46	46	45	45	45	45 (0.9)	Scotland		
45	45	45	46	45	45	45	45	45	48	45	48	45	45	45	45	45 (0.7)	Serbia		
43	44	43	43	44	43	44	45	43	45	43	45	43	43	43	43	43 (0.7)	Italy		
42	43	42	42	43	42	43	44	42	45	42	45	42	42	42	42	42 (1.2)	Malaysia		
40	41	40	41	41	41	41	41	41	43	41	43	41	41	41	41	41 (0.8)	Israel		
40	41	40	40	41	40	41	41	40	43	40	42	40	40	40	40	40 (0.4)	Cyprus		
41	41	40	40	41	40	41	40	39	40	42	40	43	40	40	40	40 (0.9)	Romania		
38	41	40	40	40	40	41	43	40	42	40	42	40	40	40	40	40 (0.5)	Norway		
38	38	37	37	38	37	37	36	37	40	37	40	37	37	37	37	37 (0.6)	Bosnia and Herzegovina		
38	37	37	36	37	36	36	36	36	39	36	39	36	36	36	36	36 (0.8)	Lebanon		
36	36	36	36	36	35	36	36	36	38	36	37	36	36	36	36	36 (1.1)	Thailand		
35	35	34	35	35	35	35	34	35	36	35	36	35	35	35	35	35 (0.9)	Turkey		
34	34	34	34	35	34	34	33	34	36	34	36	34	34	34	34	34 (0.7)	Jordan		
31	31	30	30	31	30	30	29	30	32	30	33	30	30	30	30	30 (0.9)	Georgia		
30	30	30	29	30	29	30	30	29	32	29	31	29	29	29	29	29 (0.5)	Tunisia		
29	29	28	28	29	28	29	28	28	30	28	30	28	28	28	28	28 (0.7)	Iran, Islamic Rep. of		
28	28	28	28	28	28	28	28	28	30	28	30	28	28	28	28	28 (0.5)	Egypt		
27	28	27	28	28	27	28	27	28	29	28	29	27	28	28	28	28 (0.2)	Bahrain		
28	28	27	27	28	27	28	28	27	29	27	29	27	27	27	27	27 (0.6)	Indonesia		
27	27	26	26	27	26	26	26	26	27	26	29	26	26	26	26	26 (0.6)	Syrian Arab Republic		
25	25	25	25	25	25	25	24	25	26	25	26	25	25	25	25	25 (0.5)	Palestinian Nat'l Auth.		
25	25	24	25	25	24	25	24	25	26	25	26	25	25	25	25	25 (0.4)	Oman		
25	25	24	24	25	24	25	25	24	26	24	26	24	24	24	24	24 (0.5)	Morocco		
24	24	23	24	24	23	24	24	24	24	24	24	24	24	24	24	24 (0.5)	Colombia		
22	22	21	22	22	21	22	22	22	24	22	23	22	22	22	22	22 (0.3)	Botswana		
18	18	18	18	19	18	18	18	18	19	18	20	18	18	18	18	18 (0.1)	Qatar		
18	18	17	18	18	18	18	18	17	18	18	19	18	18	18	18	18 (0.4)	Ghana		
40	41	40	40	41	40	41	41	40	42	40	42	40	40	40	40	40 (0.1)	International Avg.		
Benchmarking Participants																			
Benchmarking Participants																			
60	60	61	61	61	60	60	60	60	60	60	60	60	60	60	60	60 (1.2)	Massachusetts, US		
57	56	57	57	57	57	58	57	57	57	57	57	57	57	57	57	57 (1.2)	Minnesota, US		
55	55	55	55	55	55	55	56	55	58	55	57	55	55	55	55	55 (0.9)	Quebec, Canada		
53	52	53	53	53	54	54	53	53	53	53	53	53	53	53	53	53 (0.9)	Ontario, Canada		
50	51	50	50	51	50	51	51	50	52	50	52	50	50	50	50	50 (0.8)	British Columbia, Canada		
47	47	47	47	47	48	49	47	47	47	47	47	47	47	47	47	47 (0.7)	Basque Country, Spain		
40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40 (0.5)	Dubai, UAE		
Number of Items (Score Points) Identified*																			
202	230	210	236	227	227	218	142	236	151	236	193	236	234	233	210	217	235	236	236

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

() Standard errors appear in parentheses.

Exhibit C.2 Standard Errors for the Test-Curriculum Matching Analysis – Mathematics

TIMSS2007
Mathematics **4th**
Grade

Instructions: Read **across** the row to compare that country's performance based on the test items included by each of the countries across the top. Read **down** the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the **diagonal** to compare performance for each different country based on its own decisions about the test items to include.

Country	Average Percent Correct on All Items	Hong Kong SAR	Singapore	Chinese Taipei	Japan	Kazakhstan	Russian Federation	England	Netherlands	United States	Germany	Denmark	Australia	Hungary	Italy	Austria	Slovenia	Sweden	Slovak Republic	Scotland	New Zealand	Czech Republic	Norway	Georgia	Iran, Islamic Rep. of	Colombia	Morocco	Tunisia	
Hong Kong SAR	77 (0.7)	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Singapore	74 (0.8)	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	
Chinese Taipei	69 (0.4)	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Japan	67 (0.5)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Kazakhstan	64 (1.7)	1.7	1.7	1.6	1.6	1.7	1.6	1.7	1.7	1.6	1.7	1.7	1.6	1.7	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.7	1.5	1.5	
Russian Federation	62 (1.1)	1.1	1.1	1.1	1.1	1.0	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.0	0.9	
England	61 (0.7)	0.8	0.7	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8	
Netherlands	59 (0.5)	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	
United States	59 (0.6)	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	
Germany	57 (0.5)	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	
Denmark	57 (0.7)	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	
Australia	55 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Hungary	54 (0.8)	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Italy	53 (0.8)	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	
Austria	52 (0.5)	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Slovenia	52 (0.4)	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	
Sweden	51 (0.6)	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Slovak Republic	50 (0.9)	0.9	0.9	1.0	0.9	0.9	1.0	0.9	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
Scotland	50 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	
New Zealand	49 (0.5)	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	
Czech Republic	47 (0.7)	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Norway	44 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Georgia	38 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
Iran, Islamic Rep. of	30 (0.6)	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.7	
Colombia	23 (0.7)	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Morocco	23 (0.7)	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.7	0.6	
Tunisia	21 (0.5)	0.5	0.5	0.6	0.6	0.6	0.7	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6	
Qatar	18 (0.1)	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
Yemen	14 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
International Avg.	49 (0.1)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Benchmarking Participants																													
Massachusetts, US	69 (0.8)	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	
Minnesota, US	65 (1.3)	1.3	1.3	1.2	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.5	1.4	1.3	1.4	1.3	1.4	1.3	1.3	1.4	1.4	
Quebec, Canada	55 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8
Ontario, Canada	54 (0.7)	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	
Alberta, Canada	52 (0.7)	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	
British Columbia, Canada	52 (0.7)	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	
Dubai, UAE	39 (0.4)	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Number of Items (Score Points) Identified*	188	144	165	146	126	130	68	184	152	174	142	173	165	169	172	116	159	166	94	127	162	153	179	142	140	188	109	84	

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

* Of the 179 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 192 total score points. Following item review, some

items were deleted and response categories were combined for a number of items, resulting in 177 items and 188 score points.

Exhibit C.2 Standard Errors for the Test-Curriculum Matching Analysis – Mathematics (Continued)

TIMSS2007
Mathematics **4th**
Grade

Instructions: Read **across** the row to compare that country's performance based on the test items included by each of the countries across the top. Read **down** the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the **diagonal** to compare performance for each different country based on its own decisions about the test items to include.

Qatar	Yemen	Benchmarking Participants								Average Percent Correct on All Items	Country
		Massachusetts, US	Minnesota, US	Quebec, Canada	Ontario, Canada	Alberta, Canada	British Columbia, Canada	Dubai, UAE			
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	77 (0.7)	Hong Kong SAR	
0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	74 (0.8)	Singapore	
0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	69 (0.4)	Chinese Taipei	
0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.5	67 (0.5)	Japan	
1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.7	1.7	64 (1.7)	Kazakhstan	
1.1	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	62 (1.1)	Russian Federation	
0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	61 (0.7)	England	
0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	59 (0.5)	Netherlands	
0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	59 (0.6)	United States	
0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	57 (0.5)	Germany	
0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.7	57 (0.7)	Denmark	
0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	55 (0.8)	Australia	
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	54 (0.8)	Hungary	
0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	53 (0.8)	Italy	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	52 (0.5)	Austria	
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	52 (0.4)	Slovenia	
0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	51 (0.6)	Sweden	
0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	50 (0.9)	Slovak Republic	
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	50 (0.6)	Scotland	
0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.5	49 (0.5)	New Zealand	
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	47 (0.7)	Czech Republic	
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	44 (0.6)	Norway	
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	38 (0.9)	Georgia	
0.6	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.6	30 (0.6)	Iran, Islamic Rep. of	
0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.7	0.7	23 (0.7)	Colombia	
0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	23 (0.7)	Morocco	
0.5	0.7	0.5	0.6	0.6	0.5	0.6	0.5	0.5	21 (0.5)	Tunisia	
0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	18 (0.1)	Qatar	
0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	14 (0.4)	Yemen	
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	49 (0.1)	International Avg.	
Benchmarking Participants											
0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	69 (0.8)	Massachusetts, US	
1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	65 (1.3)	Minnesota, US	
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	55 (0.8)	Quebec, Canada	
0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	54 (0.7)	Ontario, Canada	
0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	52 (0.7)	Alberta, Canada	
0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.7	52 (0.7)	British Columbia, Canada	
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	39 (0.4)	Dubai, UAE	
178	73	188	174	165	157	140	134	188	188	Number of Items (Score Points) Identified*	

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

(*) Standard errors for the average percent of correct responses on all items appear in parentheses. The matrix contains standard errors corresponding to the average

percent correct responses based on TCMA subset of items, as displayed in Exhibit C.1.

Exhibit C.2 Standard Errors for the Test-Curriculum Matching Analysis – Mathematics (Continued)

TIMSS2007
Mathematics **8th** Grade

Instructions: Read **across** the row to compare that country's performance based on the test items included by each of the countries across the top. Read **down** the column under a country name to compare the performance of the country down the left on the items included by the country listed on the top. Read along the **diagonal** to compare performance for each different country based on its own decisions about the test items to include.

											Benchmarking Participants											Country
Iran, Islamic Rep. of	Egypt	Bahrain	Indonesia	Syrian Arab Republic	Palestinian Nat'l Auth.	Oman	Morocco	Colombia	Botswana	Qatar	Ghana	Massachusetts, US	Minnesota, US	Quebec, Canada	Ontario, Canada	British Columbia, Canada	Basque Country, Spain	Dubai, UAE	Average Percent Correct on All Items			
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	71 (0.5)	Korea, Rep. of		
1.0	0.9	1.0	1.0	0.9	1.0	0.9	0.9	1.0	0.9	1.0	0.9	1.0	1.0	0.9	1.0	1.0	1.0	1.0	71 (1.0)	Chinese Taipei		
1.0	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	70 (0.9)	Singapore		
1.4	1.3	1.4	1.3	1.3	1.4	1.3	1.4	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	1.3	66 (1.3)	Hong Kong SAR		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	66 (0.5)	Japan		
0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	53 (0.8)	Hungary		
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	52 (1.2)	England		
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	51 (1.0)	Russian Federation		
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	50 (0.7)	United States		
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	49 (0.6)	Czech Republic		
0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	48 (0.5)	Slovenia		
0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	47 (0.9)	Australia		
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	46 (0.2)	Malta		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	46 (0.5)	Sweden		
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	45 (0.9)	Scotland		
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	45 (0.7)	Serbia		
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	43 (0.7)	Italy		
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	42 (1.2)	Malaysia		
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	41 (0.8)	Israel		
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	40 (0.4)	Cyprus		
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	40 (0.9)	Romania		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	40 (0.5)	Norway		
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	37 (0.6)	Bosnia and Herzegovina		
0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	36 (0.8)	Lebanon		
1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	36 (1.1)	Thailand		
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	35 (0.9)	Turkey		
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	34 (0.7)	Jordan		
0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	30 (0.9)	Georgia		
0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	29 (0.5)	Tunisia		
0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	28 (0.7)	Iran, Islamic Rep. of		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	28 (0.5)	Egypt		
0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	28 (0.2)	Bahrain		
0.6	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	27 (0.6)	Indonesia		
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	26 (0.6)	Syrian Arab Republic		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	25 (0.5)	Palestinian Nat'l Auth.		
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	25 (0.4)	Oman		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	24 (0.5)	Morocco		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	24 (0.5)	Colombia		
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	22 (0.3)	Botswana		
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	18 (0.1)	Qatar		
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	18 (0.4)	Ghana		
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	40 (0.1)	International Avg.		
Benchmarking Participants																						
1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	60 (1.2)	Massachusetts, US		
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	57 (1.2)	Minnesota, US		
0.9	0.8	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	55 (0.9)	Quebec, Canada		
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	53 (0.9)	Ontario, Canada		
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	50 (0.8)	British Columbia, Canada		
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	47 (0.7)	Basque Country, Spain		
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	40 (0.5)	Dubai, UAE		
Benchmarking Participants																						
202	230	210	236	227	227	218	142	236	151	236	193	236	234	233	210	217	235	236	236	Number of Items (Score Points) Identified*		

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

() Standard errors for the average percent of correct responses on all items appear in parentheses. The matrix contains standard errors corresponding to the average

percent correct responses based on TCMA subset of items, as displayed in Exhibit C.1.

