

Appendix C

The Test-Curriculum Matching Analysis: Science

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 science that participating countries agreed should be the focus of an international assessment of science 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 science, 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' science 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 science 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 science 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 science test at fourth and eighth grades. Exhibit C.1 shows the average percent correct on the science 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 fourth grade, the maximum number of score points in the assessment was 189 points.³ Reading along the bottom row, it can be seen that only

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

3 The TIMSS 2007 fourth grade science assessment contained 174 items yielding 194 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 171 items and 189 score points. Similarly, following item review, the 214 items and 240 score points in the eighth grade assessment were reduced to 210 items and 231 score points.

six participants—Singapore, Chinese Taipei, the Russian Federation, Japan, Tunisia, and the state of Massachusetts—judged less than half of the science items included in their curricula, although interestingly, five of the six were among the highest performers on the TIMSS 2007 assessment. Two countries, Australia and Colombia, and 2 benchmarking participants, Minnesota and Dubai, judged 100 percent of the items (all 189 score points) to be included in their curricula. A further 11 countries and 3 benchmarking participants judged 75 percent or more (142 score points) to be appropriate.

At the eighth grade, the percentage of items judged appropriate was somewhat higher; with 5 countries and 2 benchmarking participants accepting 100 percent of the items (all 231 score points) and a further 24 countries and 4 benchmarking participants judging 75 percent or more (173 score points) to be appropriate. Only Cyprus with 115 score points had less than half the score points judged appropriate.

Since most countries indicated that 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, Singapore, where the average percent correct was 78 percent on its own set of items, had 71 percent correct on the items selected by Chinese Taipei, 71 percent on the items selected by Hong Kong SAR, 74 percent on the items selected by the Russian Federation, and so forth. The column for a country listed at the top shows how each of the other participants performed on the set of items selected as appropriate for that country's students. Using the

4 It should be noted that the science 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.

set of items selected by England as an example, 69 percent of these items, on average, were answered correctly by students in Singapore, 63 percent by students in Chinese Taipei, 62 percent by students in Hong Kong SAR, 61 percent by students in the Russian Federation, 61 percent by those in Japan, 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, English students averaged 60 percent correct on the set of items identified by England 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 selection of items by the participating countries varied somewhat in average difficulty, ranging at the fourth grade from 49 percent correct for those chosen by Singapore to 56 percent correct for those chosen by the Russian Federation. Similarly at the eighth grade, the average percent correct ranged from 40 percent for those items chosen by Singapore, Cyprus, Georgia, Ontario, and Quebec to 43 percent for those chosen by the Russian Federation and the Palestinian National Authority.

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 usually not by much. Singapore had one of the greatest differences. The average percent correct for Singapore across all fourth-grade science items was 68 percent. The diagonal element shows that Singaporean students had a greater average percent correct (78 percent) across the set of items selected as appropriate for Singapore than they did overall. However, most participants had a difference of one or two percentage points between the two performance measures. In addition to Singapore with a difference of 10 percentage points, other exceptions included the Russian Federation (a difference of 8 points); Japan and Tunisia (6 points); and Slovenia, Iran, and Alberta (5 points). At the eighth grade, the differences were generally less; the largest being in Japan (6 percentage points), and the Russian Federation (5 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 science items also had relatively high or low performance on each of the various sets of items selected for the TCMA. For example, at the eighth grade, Singapore had the highest average percent correct not only on the test as a whole, but also on all of the different item selections (with some ties), with Chinese Taipei, Korea, 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 127 score points selected by Malta at the eighth grade. The students in Malta did better on these items (42% correct) than on the test as a whole (38% correct). However, most other countries also did better on these particular items, with an international average of 42 percent correct compared with 41 percent correct overall. In general, the TIMSS participants that performed as well or better than Malta on the overall test also performed as well or better on the items selected by Malta.

The TCMA results provide evidence that the TIMSS 2007 science 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 – Science (Continued)

TIMSS2007
Science **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								Country
Morocco	Yemen	Massachusetts, US	Minnesota, US	Alberta, Canada	British Columbia, Canada	Ontario, Canada	Quebec, Canada	Dubai, UAE	Average Percent Correct on All Items	
70	69	72	68	71	69	69	69	68	68 (0.7)	Singapore
62	61	63	62	66	62	62	62	62	62 (0.4)	Chinese Taipei
61	61	61	61	65	61	61	60	61	61 (0.7)	Hong Kong SAR
61	60	61	60	64	60	61	61	60	60 (1.0)	Russian Federation
59	58	58	60	65	60	60	58	60	60 (0.4)	Japan
59	59	60	59	63	59	59	59	59	59 (0.6)	England
60	59	61	59	63	59	59	59	59	59 (0.5)	United States
59	59	60	58	62	58	59	58	58	58 (1.2)	Kazakhstan
60	59	61	58	61	58	59	59	58	58 (0.7)	Italy
60	58	57	58	62	58	59	58	58	58 (0.7)	Hungary
58	57	58	57	60	57	57	57	57	57 (0.9)	Slovak Republic
57	56	58	57	61	57	57	56	57	57 (0.6)	Australia
57	56	56	56	60	56	56	56	56	56 (0.4)	Germany
56	56	55	56	60	56	56	56	56	56 (0.5)	Austria
56	56	55	56	60	56	56	56	56	56 (0.6)	Sweden
55	55	53	56	60	55	56	54	56	56 (0.5)	Netherlands
54	55	55	54	58	54	54	54	54	54 (0.4)	Slovenia
54	54	54	54	58	54	54	54	54	54 (0.5)	Denmark
55	54	56	54	58	54	55	55	54	54 (0.6)	Czech Republic
52	52	53	52	56	52	52	52	52	52 (0.5)	New Zealand
51	51	53	51	55	51	51	51	51	51 (0.4)	Scotland
46	47	46	47	50	46	46	46	47	47 (0.5)	Norway
41	41	42	39	42	40	40	40	39	39 (0.7)	Iran, Islamic Rep. of
37	37	37	36	39	36	36	37	36	36 (0.7)	Georgia
34	34	35	34	37	34	34	34	34	34 (0.7)	Colombia
26	26	26	25	27	25	25	25	25	25 (0.6)	Tunisia
25	24	27	23	26	24	23	25	23	23 (0.2)	Qatar
24	24	26	23	25	24	23	24	23	23 (0.6)	Morocco
17	17	19	17	18	17	17	17	17	17 (0.5)	Yemen
51	50	51	50	54	50	50	50	50	50 (0.1)	International Avg.
Benchmarking Participants										
66	64	66	65	70	66	65	65	65	65 (0.8)	Massachusetts, US
61	61	62	61	65	61	61	61	61	61 (1.2)	Minnesota, US
61	60	62	60	65	60	60	60	60	60 (0.7)	Alberta, Canada
59	59	61	59	63	59	59	59	59	59 (0.5)	British Columbia, Canada
59	59	60	58	63	59	59	58	58	58 (0.7)	Ontario, Canada
55	54	55	54	58	54	55	54	54	54 (0.5)	Quebec, Canada
46	46	48	45	48	45	44	46	45	45 (0.4)	Dubai, UAE
121	102	74	189	149	163	156	126	189	189	Number of Items (Score Points) Identified*

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

() Standard errors appear in parentheses.

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

TIMSS2007
Science 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 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
Tunisia	Oman	Georgia	Indonesia	Egypt	Lebanon	Palestinian Nat'l Auth.	Colombia	Morocco	Botswana	Qatar	Ghana	Massachusetts, US	Minnesota, US	British Columbia, Canada	Ontario, Canada	Quebec, Canada	Basque Country, Spain	Dubai, UAE	Average Percent Correct on All Items									
61	60	61	61	61	60	62	60	62	63	61	60	62	60	59	59	59	59	60	60 (0.9)	Singapore								
60	59	58	59	60	58	61	58	60	61	59	58	59	58	59	57	58	58	58	58 (0.8)	Chinese Taipei								
58	57	55	58	58	57	59	57	57	60	57	57	56	57	57	55	57	57	57	57 (0.4)	Korea, Rep. of								
59	57	58	57	57	56	58	56	58	59	57	56	57	56	55	55	56	56	56	56 (0.4)	Japan								
55	54	53	55	54	54	55	54	55	55	57	55	54	54	54	54	54	54	54	54 (1.0)	England								
55	53	52	54	54	53	55	53	54	54	53	53	52	53	52	52	53	53	53	53 (0.6)	Hungary								
54	53	52	54	52	53	55	53	55	53	53	53	53	53	52	52	53	53	53	53 (0.4)	Czech Republic								
54	53	52	53	53	53	54	53	54	54	53	53	53	53	52	53	53	53	53	53 (0.4)	Slovenia								
53	52	51	53	54	51	54	51	54	51	54	52	51	51	51	51	51	51	51	51 (0.9)	Russian Federation								
51	52	51	53	53	51	53	51	53	54	52	51	52	51	51	50	51	51	51	51 (1.0)	Hong Kong SAR								
49	49	47	50	48	49	49	49	49	51	49	49	49	49	49	49	49	49	49	49 (0.6)	United States								
47	47	46	49	46	47	47	47	47	49	48	47	47	47	48	48	47	47	47	47 (0.8)	Australia								
47	47	45	48	47	47	48	47	48	49	47	47	47	47	46	47	47	47	47	47 (0.5)	Sweden								
44	44	43	45	44	44	45	44	46	45	44	44	44	44	44	43	44	44	44	44 (0.6)	Italy								
44	44	42	45	44	44	44	44	44	45	44	43	44	44	43	43	43	44	44	44 (0.7)	Scotland								
45	44	43	44	45	43	46	43	45	45	44	43	43	43	41	44	43	43	43	43 (0.8)	Jordan								
41	42	40	43	41	42	43	42	42	43	42	42	41	42	42	41	42	42	42	42 (0.4)	Norway								
41	41	39	41	42	40	43	40	42	41	40	40	40	40	39	39	40	40	40	40 (0.6)	Serbia								
42	40	38	41	41	40	41	40	41	41	40	40	39	40	40	39	40	40	40	40 (0.8)	Israel								
41	40	39	41	41	40	42	40	41	43	40	40	41	40	40	38	39	40	40	40 (1.1)	Malaysia								
40	40	39	41	42	40	42	40	42	42	41	40	40	40	40	38	39	39	40	40 (0.3)	Bahrain								
40	39	38	40	40	39	41	39	41	42	40	39	39	39	39	39	39	39	39	39 (0.9)	Thailand								
40	39	39	40	42	39	42	39	42	40	40	39	39	39	38	39	39	39	39	39 (0.6)	Bosnia and Herzegovina								
38	39	37	39	39	38	40	38	38	40	39	38	37	38	38	38	38	38	38	38 (0.2)	Malta								
40	38	38	39	39	38	40	38	40	39	38	38	37	38	38	37	38	38	38	38 (0.6)	Romania								
38	38	37	38	37	37	39	37	39	39	38	37	37	37	37	37	37	37	37	37 (0.7)	Iran, Islamic Rep. of								
37	37	37	38	38	37	39	37	37	38	37	37	37	37	35	37	37	37	37	37 (0.7)	Turkey								
37	36	36	37	38	36	39	36	39	37	37	36	36	36	35	36	36	36	36	36 (0.5)	Syrian Arab Republic								
37	36	36	37	37	36	38	36	37	38	37	36	36	36	35	36	36	36	36	36 (0.3)	Cyprus								
35	34	33	35	35	33	36	33	35	37	34	33	33	33	32	33	33	33	33	33 (0.3)	Tunisia								
33	33	32	33	34	32	35	32	32	35	33	32	33	32	31	33	32	32	32	32 (0.5)	Oman								
34	32	32	33	35	32	35	32	35	33	32	32	32	32	30	32	32	32	32	32 (0.7)	Georgia								
32	32	31	33	33	31	33	31	33	33	34	31	31	31	30	31	31	31	31	31 (0.5)	Indonesia								
31	32	31	32	33	31	34	31	32	32	32	31	31	31	29	31	31	31	31	31 (0.5)	Egypt								
33	32	31	32	33	31	35	31	33	32	32	31	31	31	29	31	31	31	31	31 (0.9)	Lebanon								
32	32	30	32	33	31	34	31	32	33	32	31	31	31	29	31	31	31	31	31 (0.5)	Palestinian Nat'l Auth.								
30	30	29	31	31	30	31	30	31	31	30	30	30	30	29	30	29	30	30	30 (0.5)	Colombia								
28	28	27	29	29	27	30	27	29	28	28	27	28	27	28	26	27	27	27	27 (0.4)	Morocco								
24	24	23	25	26	24	26	24	24	27	24	24	25	24	24	22	23	24	24	24 (0.2)	Botswana								
23	23	22	23	24	22	25	22	23	23	23	22	23	22	21	22	22	22	22	22 (0.1)	Qatar								
21	20	20	22	20	22	20	22	20	21	20	20	21	20	20	18	20	20	20	20 (0.4)	Ghana								
42	41	40	42	42	41	43	41	42	42	41	41	41	41	41	40	40	41	41	41 (0.1)	International Avg.								
														Benchmarking Participants														
57	56	55	58	55	57	57	57	57	59	57	57	57	57	57	57	57	57	57	57 (0.9)	Massachusetts, US								
53	52	51	54	51	53	52	53	53	55	53	53	53	53	53	52	53	53	53	53 (1.1)	Minnesota, US								
49	50	47	51	49	50	50	50	50	52	50	50	49	50	51	50	50	50	50	50 (0.6)	British Columbia, Canada								
49	49	47	51	49	50	50	50	49	53	50	50	50	50	50	50	50	50	50	50 (0.8)	Ontario, Canada								
45	45	44	47	46	45	46	45	46	47	45	45	45	45	46	45	45	45	45	45 (0.6)	Quebec, Canada								
44	44	43	46	44	44	45	44	45	45	44	44	44	44	44	43	44	44	44	44 (0.6)	Basque Country, Spain								
45	45	43	45	46	44	46	44	45	46	45	44	44	44	44	43	44	44	44	44 (0.5)	Dubai, UAE								
139	209	152	217	148	231	177	231	125	143	200	230	125	231	218	192	182	229	231	231	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.2 Standard Errors for the Test-Curriculum Matching Analysis – Science

TIMSS2007
Science 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	Singapore	Chinese Taipei	Hong Kong SAR	Russian Federation	Japan	England	United States	Kazakhstan	Italy	Hungary	Slovak Republic	Australia	Germany	Austria	Sweden	Netherlands	Slovenia	Denmark	Czech Republic	New Zealand	Scotland	Norway	Iran, Islamic Rep. of	Georgia	Colombia	Tunisia	Qatar
Singapore	68 (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	0.7	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
Chinese Taipei	62 (0.4)	0.4	0.5	0.4	0.4	0.6	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
Hong Kong SAR	61 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7
Russian Federation	60 (1.0)	1.1	1.1	1.0	0.9	1.2	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
Japan	60 (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	0.4
England	59 (0.6)	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6
United States	59 (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	58 (1.2)	1.2	1.2	1.1	1.1	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.2
Italy	58 (0.7)	0.7	0.7	0.7	0.7	0.8	0.6	0.7	0.7	0.7	0.7	0.7	0.6	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
Hungary	58 (0.7)	0.7	0.8	0.7	0.7	0.9	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
Slovak Republic	57 (0.9)	0.9	0.9	0.9	1.0	0.8	0.9	0.9	0.9	0.9	0.9	0.9	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
Australia	57 (0.6)	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Germany	56 (0.4)	0.4	0.5	0.4	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.4
Austria	56 (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
Sweden	56 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	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	0.6	0.5
Netherlands	56 (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	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
Slovenia	54 (0.4)	0.4	0.4	0.4	0.5	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	0.4
Denmark	54 (0.5)	0.6	0.6	0.6	0.6	0.7	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.5
Czech Republic	54 (0.6)	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
New Zealand	52 (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
Scotland	51 (0.4)	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Norway	47 (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	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Iran, Islamic Rep. of	39 (0.7)	0.8	0.8	0.7	0.8	0.9	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	0.8	0.7	0.7	0.7	0.8	0.7
Georgia	36 (0.7)	0.6	0.7	0.7	0.8	0.8	0.7	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	0.8
Colombia	34 (0.7)	0.8	0.8	0.8	0.9	0.9	0.8	0.7	0.8	0.7	0.8	0.8	0.7	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	0.7	0.8
Tunisia	25 (0.6)	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.8	0.6
Qatar	23 (0.2)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Morocco	23 (0.6)	0.7	0.6	0.7	0.7	0.8	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.6
Yemen	17 (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	0.5	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	0.5
International Avg.	50 (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	65 (0.8)	0.9	0.8	0.8	0.8	1.1	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	0.7	0.8
Minnesota, US	61 (1.2)	1.2	1.3	1.2	1.3	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.4	1.2
Alberta, Canada	60 (0.7)	0.8	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	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
British Columbia, Canada	59 (0.5)	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5
Ontario, Canada	58 (0.7)	0.7	0.8	0.8	0.8	0.8	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	0.6	0.7	0.7
Quebec, Canada	54 (0.5)	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5
Dubai, UAE	45 (0.4)	0.5	0.5	0.5	0.5	0.6	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	0.5	0.4	0.4	0.5	0.4
Number of Items (Score Points) Identified*	189	70	91	120	94	51	131	174	149	148	184	143	189	158	160	139	132	157	157	149	133	112	151	116	133	189	67	130

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

* Of the 174 items in the Science test, some extended-response items were scored on a two-point scale, resulting in 194 total score points. Following item review, some items

were deleted and response categories were combined for a number of items, resulting in 171 items and 189 score points.

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

TIMSS2007
Science 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.

Morocco	Yemen	Benchmarking Participants								Average Percent Correct on All Items	Country
		Massachusetts, US	Minnesota, US	Alberta, Canada	British Columbia, Canada	Ontario, Canada	Quebec, Canada	Dubai, UAE			
0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.7	68 (0.7)	Singapore	
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	62 (0.4)	Chinese Taipei	
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	61 (0.7)	Hong Kong SAR	
1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	60 (1.0)	Russian Federation	
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	60 (0.4)	Japan	
0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	59 (0.6)	England	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	59 (0.5)	United States	
1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	58 (1.2)	Kazakhstan	
0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	58 (0.7)	Italy	
0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	58 (0.7)	Hungary	
0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	57 (0.9)	Slovak Republic	
0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	57 (0.6)	Australia	
0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	56 (0.4)	Germany	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	56 (0.5)	Austria	
0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	56 (0.6)	Sweden	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	56 (0.5)	Netherlands	
0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	54 (0.4)	Slovenia	
0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	54 (0.5)	Denmark	
0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	54 (0.6)	Czech Republic	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	52 (0.5)	New Zealand	
0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	51 (0.4)	Scotland	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	47 (0.5)	Norway	
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	39 (0.7)	Iran, Islamic Rep. of	
0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	36 (0.7)	Georgia	
0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.8	0.7	34 (0.7)	Colombia	
0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	25 (0.6)	Tunisia	
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	23 (0.2)	Qatar	
0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.6	23 (0.6)	Morocco	
0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	17 (0.5)	Yemen	
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	50 (0.1)	International Avg.	
Benchmarking Participants											
0.7	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	65 (0.8)	Massachusetts, US	
1.3	1.2	1.1	1.2	1.3	1.3	1.3	1.3	1.2	61 (1.2)	Minnesota, US	
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	60 (0.7)	Alberta, Canada	
0.5	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.5	59 (0.5)	British Columbia, Canada	
0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	58 (0.7)	Ontario, Canada	
0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	54 (0.5)	Quebec, Canada	
0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	45 (0.4)	Dubai, UAE	
121	102	74	189	149	163	156	126	189	189	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 – Science (Continued)

TIMSS2007
Science 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 test 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.

Tunisia	Oman	Georgia	Indonesia	Egypt	Lebanon	Palestinian Nat'l Auth.	Colombia	Morocco	Botswana	Qatar	Ghana	Benchmarking Participants							Country	
Massachusetts, US	Minnesota, US	British Columbia, Canada	Ontario, Canada	Quebec, Canada	Basque Country, Spain	Dubai, UAE	Average Percent Correct on All Items													
1.0	0.9	1.0	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	60 (0.9)	Singapore	
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	0.7	0.8	0.8	58 (0.8)	Chinese Taipei	
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	57 (0.4)	Korea, Rep. of	
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	56 (0.4)	Japan	
1.0	0.9	0.9	1.0	0.9	1.0	0.9	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	54 (1.0)	England	
0.7	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	0.6	0.6	0.6	0.6	53 (0.6)	Hungary	
0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	53 (0.4)	Czech Republic	
0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.4	53 (0.4)	Slovenia	
0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	51 (0.9)	Russian Federation	
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	51 (1.0)	Hong Kong SAR	
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	0.7	0.6	0.6	49 (0.6)	United States	
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	47 (0.8)	Australia	
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	47 (0.5)	Sweden	
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	44 (0.6)	Italy	
0.7	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	44 (0.7)	Scotland	
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	0.8	0.8	43 (0.8)	Jordan	
0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	42 (0.4)	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	0.5	0.6	0.6	40 (0.6)	Serbia	
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	40 (0.8)	Israel	
1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1	40 (1.1)	Malaysia	
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	40 (0.3)	Bahrain	
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	39 (0.9)	Thailand	
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	39 (0.6)	Bosnia and Herzegovina	
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	38 (0.2)	Malta	
0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.7	0.6	38 (0.6)	Romania	
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	37 (0.7)	Iran, Islamic Rep. of	
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	37 (0.7)	Turkey	
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	36 (0.5)	Syrian Arab Republic	
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	36 (0.3)	Cyprus	
0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	33 (0.3)	Tunisia	
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	32 (0.5)	Oman	
0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.9	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	32 (0.7)	Georgia	
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	31 (0.5)	Indonesia	
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	31 (0.5)	Egypt	
0.9	0.9	0.9	1.0	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.8	0.9	0.9	31 (0.9)	Lebanon	
0.5	0.5	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	31 (0.5)	Palestinian Nat'l Auth.	
0.6	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.7	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.5	30 (0.5)	Colombia	
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.4	27 (0.4)	Morocco	
0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	24 (0.2)	Botswana	
0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	22 (0.1)	Qatar	
0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.4	20 (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	41 (0.1)	International Avg.	
													Benchmarking Participants							
1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.9	1.0	1.0	1.0	0.9	1.0	0.9	1.0	1.0	1.0	0.9	57 (0.9)	Massachusetts, US	
1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	53 (1.1)	Minnesota, US	
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	50 (0.6)	British Columbia, Canada	
0.8	0.7	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	50 (0.8)	Ontario, Canada	
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	0.7	0.6	0.6	45 (0.6)	Quebec, Canada	
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	44 (0.6)	Basque Country, Spain	
0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	44 (0.5)	Dubai, UAE	
139	209	152	217	148	231	177	231	125	143	200	230	125	231	218	192	182	229	231	231	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.

