Appendix F

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 2011 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 2011 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 (NRCs) from each country formally approved the TIMSS 2011 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 2011 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 2011 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 2011 tests were relevant to the curricula of the TIMSS countries and benchmarking participants, NRCs 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 NRCs were 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 the fourth or eighth grades. For example, in Sweden the curriculum specifies the curricular goals to be achieved by the end of

1 Because there also may be curriculum areas covered in some countries that are not covered by the TIMSS 2011 tests, the TCMA does not provide complete information about how well the tests cover the curricula of the countries.

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] Because an item might be in the curriculum for some but not all students in a country, NRCs were asked to consider an item included if it was in the intended curriculum for more than 50 percent of the students. All TIMSS 2011 participants took part in the TCMA analysis except Bahrain, Georgia, Saudi Arabia, Honduras (sixth grade participant) and the US benchmarking states at the fourth grade, and Bahrain, Georgia, Ghana, Indonesia, Saudi Arabia, Syrian Arab Republic, Honduras (ninth grade partipant), and the US benchmarking states at the eighth grade.

Exhibits F.1 through F.4 present the TCMA results for the TIMSS 2011 mathematics test at fourth and eighth grades. Exhibits F.1 and F.2 show the average percent correct on the mathematics items judged appropriate by each country at the fourth and eighth grades, respectively. Exhibits F.3 and F.4 show the standard errors corresponding to the percentages presented in Exhibits F.1 and F.2.

In Exhibit F.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 184 points.[3] Generally, the proportion of items judged appropriate was fairly high. Reading along the bottom row, it can be seen that two of the 47 countries that took part in the TCMA analysis judged 100 percent of the items to be included in their curricula. Another 38 countries and all of the sixth grade and benchmarking participants judged 75 percent or more (138 score points) to be appropriate. Only the Russian Federation judged less than half of the mathematics items to be included in their curricula.

At the eighth grade, the percentage of items judged appropriate was somewhat higher; four of the 36 countries and one of the five benchmarking participants judged 100 percent of the items to be appropriate (all 230 score points), and an additional 30 countries, two ninth grade, and four benchmarking participants judged 75 percent or more (173 score points) to be appropriate. For all participants, the majority of the eighth grade mathematics items were judged to be appropriate to their curricula.

Because most countries indicated that at least some items were not included in their intended curriculum at the grade tested, the data were

2 Exhibit 5 of the *TIMSS 2011 Encyclopedia* provides information on the grade-to-grade structure of the curriculum for each TIMSS 2011 participant.

3 The TIMSS 2011 fourth grade mathematics assessment contained 175 items, yielding 185 score points. However, following item review, response categories for one of the items were combined, resulting in data for 184 score points. Similarly, following item review, the 217 items and 232 score points in the eighth grade assessment were reduced to 230 score points.

Appendix F.1: Average Percent Correct for the Test-Curriculum Matching Analysis

TIMSS 2011 Mathematics 4th Grade

Based on a subset of items specifically identified by each country as addressing its curriculum

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	Korea, Rep. of	Hong Kong SAR	Chinese Taipei	Japan	Northern Ireland	Belgium (Flemish)	Russian Federation	England	United States	Finland	Denmark	Netherlands	Portugal	Lithuania	Germany	Ireland	Hungary	Australia	Serbia	Slovenia	Czech Republic	Italy	Slovak Republic	Austria	Kazakhstan	Sweden	Malta	Norway	Croatia
Singapore	74 (0.7)	75	74	74	75	74	75	74	73	75	76	76	75	74	75	73	74	74	74	74	75	75	73	75	74	74	72	74	75	74	72
Korea, Rep. of	74 (0.4)	75	77	73	77	77	74	75	75	74	77	76	75	74	75	74	75	74	75	75	76	75	74	75	77	77	75	76	74	74	75
Hong Kong SAR	74 (0.8)	75	74	74	75	74	75	74	72	74	76	75	75	75	75	73	74	74	75	74	75	75	74	75	74	75	72	74	75	74	73
Chinese Taipei	71 (0.4)	71	73	70	74	74	72	73	72	71	73	72	71	71	71	71	71	71	71	72	73	71	70	71	73	74	71	74	70	71	71
Japan	70 (0.4)	70	72	69	73	74	70	71	70	70	72	71	70	70	70	71	71	69	71	71	72	70	70	71	72	73	70	72	70	70	70
Northern Ireland	65 (0.6)	65	63	64	65	64	66	65	60	65	67	65	66	66	65	64	65	64	65	65	66	65	64	65	64	65	62	65	66	65	62
Belgium (Flemish)	62 (0.5)	62	61	61	63	61	62	63	59	62	64	63	62	62	62	60	62	61	62	62	63	63	61	62	63	63	60	63	62	62	61
Russian Federation	61 (0.9)	60	61	60	62	62	61	61	65	61	63	62	61	62	61	61	63	60	63	60	63	62	63	61	65	64	63	62	61	61	63
England	60 (0.8)	60	58	59	59	59	61	59	55	60	62	61	61	61	61	59	62	59	61	60	61	61	60	61	60	61	57	60	61	60	58
United States	60 (0.5)	60	59	59	60	59	61	60	56	60	62	61	60	60	60	59	60	60	61	60	62	61	60	60	61	61	58	60	61	60	58
Finland	60 (0.6)	59	59	58	60	59	61	60	55	60	62	61	61	61	60	59	61	59	60	61	62	61	60	60	62	62	58	62	60	60	58
Denmark	59 (0.6)	58	58	57	58	58	59	59	55	59	60	59	60	59	59	57	60	57	59	59	59	59	59	59	60	60	57	60	58	59	58
Netherlands	59 (0.4)	58	59	57	59	59	59	59	57	59	61	60	60	61	59	58	60	57	59	60	61	60	59	59	62	62	58	61	59	59	59
Portugal	59 (0.8)	58	58	56	58	59	59	58	57	59	60	59	59	59	59	58	62	58	60	59	59	59	60	59	60	61	58	59	58	59	59
Lithuania	58 (0.6)	57	58	56	58	59	58	58	58	58	60	59	59	60	59	59	60	57	60	59	60	59	59	59	60	61	58	59	58	58	58
Germany	57 (0.6)	56	55	54	55	57	57	57	56	57	59	57	58	58	57	57	61	56	58	57	58	59	60	58	60	60	57	57	57	57	58
Ireland	56 (0.6)	56	55	55	57	56	57	56	52	57	58	57	57	57	57	56	57	56	57	57	58	57	55	57	57	57	53	57	57	57	54
Hungary	55 (0.7)	54	54	53	54	54	55	55	55	55	56	55	56	55	55	54	57	54	57	54	57	57	57	55	57	58	56	56	55	55	55
Australia	54 (0.6)	53	52	52	53	53	55	53	48	54	55	55	55	55	54	53	55	53	55	54	55	55	54	55	55	55	52	55	54	54	53
Serbia	54 (0.7)	54	55	53	56	56	55	55	57	54	56	54	55	55	54	55	56	54	56	55	58	56	56	55	57	58	56	56	54	54	57
Slovenia	53 (0.5)	52	52	51	52	52	54	53	50	53	55	54	54	54	53	53	57	52	56	53	55	56	56	54	56	57	53	54	54	53	53
Czech Republic	52 (0.6)	51	53	50	52	52	53	53	54	52	54	53	53	53	53	52	56	51	55	52	55	55	56	53	57	57	55	54	52	53	55
Italy	52 (0.7)	51	52	50	53	52	52	52	50	52	54	53	52	51	52	51	54	51	53	52	53	53	53	53	54	54	51	53	52	52	52
Slovak Republic	52 (0.8)	51	53	50	53	53	52	52	55	52	54	53	53	53	52	52	55	51	53	52	55	54	54	52	57	56	54	53	51	52	54
Austria	52 (0.7)	51	51	49	51	52	52	52	53	52	54	52	52	53	52	52	56	51	53	52	54	53	54	52	55	56	53	53	52	52	53
Kazakhstan	52 (1.1)	52	52	51	52	52	52	52	56	52	53	52	52	52	52	51	53	52	53	51	53	53	53	52	54	54	53	52	51	52	53
Sweden	50 (0.5)	49	51	48	51	51	50	50	50	50	52	51	51	51	50	50	53	49	51	51	52	51	52	51	54	54	50	53	50	50	51
Malta	49 (0.3)	49	47	48	48	48	50	48	44	49	51	50	50	50	49	49	50	48	50	49	50	51	49	49	49	50	45	48	50	49	45
Norway	48 (0.7)	47	47	46	48	47	49	48	46	49	50	50	49	49	49	48	51	47	50	49	50	50	50	49	50	51	47	50	48	49	48
Croatia	48 (0.4)	47	49	46	50	49	48	49	54	48	50	48	48	47	48	47	52	47	50	48	52	49	51	48	53	53	52	50	47	48	52
Romania	47 (1.2)	47	48	46	48	48	48	48	50	47	49	48	48	48	47	48	49	47	48	48	49	49	48	48	49	50	48	49	47	47	48
New Zealand	46 (0.5)	45	44	43	45	45	47	46	40	46	48	47	47	48	46	45	48	45	47	47	48	48	47	47	47	48	44	47	47	46	44
Spain	45 (0.6)	44	46	42	46	46	46	45	43	45	47	46	46	45	45	45	48	44	46	46	47	46	46	46	48	48	44	47	45	45	45
Poland	45 (0.5)	45	46	43	46	46	46	46	47	45	48	46	46	46	45	45	49	44	47	46	48	47	48	46	49	49	47	48	45	45	47
Turkey	45 (0.8)	45	46	44	48	47	46	45	46	45	47	46	45	45	45	45	47	45	46	45	47	46	45	45	47	47	44	46	45	45	44
Azerbaijan	43 (1.2)	44	44	44	46	44	44	44	51	43	45	44	44	44	44	43	44	44	44	43	45	44	44	44	45	46	46	44	43	44	46
Chile	41 (0.5)	40	41	39	41	41	42	41	39	41	43	42	42	41	41	42	44	41	43	42	43	43	42	42	43	44	40	43	41	42	40
Thailand	41 (1.0)	41	42	41	44	42	41	41	42	40	42	42	41	41	41	41	42	41	42	41	41	41	41	41	43	43	40	42	41	41	40
Armenia	40 (0.8)	40	41	40	42	41	40	41	46	40	42	40	40	41	40	40	41	40	41	40	42	41	41	40	42	42	43	41	40	40	42
United Arab Emirates	37 (0.4)	37	37	35	38	37	38	37	35	37	38	38	38	37	37	37	38	37	38	37	38	38	37	37	38	38	35	38	37	37	36
Iran, Islamic Rep. of	37 (0.7)	36	37	37	39	36	37	36	37	36	37	37	37	36	37	37	38	37	38	36	38	37	37	37	37	38	36	37	36	37	37
Qatar	34 (0.6)	34	33	32	34	33	34	34	31	34	35	34	35	34	34	34	35	34	35	34	35	35	34	34	35	35	32	35	34	34	32
Oman	30 (0.4)	29	29	29	31	29	30	29	28	29	30	30	30	29	29	29	30	29	30	29	30	30	29	30	30	30	28	30	29	30	28
Tunisia	25 (0.5)	25	26	25	27	26	25	25	31	24	26	25	25	25	25	25	26	25	25	25	26	25	26	25	26	27	27	25	25	25	27
Morocco	24 (0.6)	23	23	22	24	23	23	23	24	23	24	24	24	23	24	23	25	23	24	23	23	23	24	24	23	24	23	23	23	23	24
Kuwait	23 (0.4)	23	22	22	24	22	23	23	21	23	24	23	24	23	23	23	23	23	24	23	24	23	23	23	23	23	21	23	23	23	21
Yemen	16 (0.4)	16	16	15	18	16	16	16	17	16	16	16	16	16	16	16	16	16	16	16	17	15	15	16	16	16	16	17	16	16	16
International Avg.	50 (0.1)	50	50	49	51	51	51	50	50	50	52	51	51	51	51	50	52	50	51	51	52	51	51	51	52	53	50	51	50	51	50
Botswana (6)	35 (0.7)	34	34	33	35	34	35	34	31	34	36	35	35	35	35	34	35	34	35	34	36	35	34	35	35	36	32	34	35	35	33
Yemen (6)	24 (0.6)	24	24	22	25	24	24	24	24	23	24	24	24	23	24	24	24	24	24	24	25	24	23	24	25	25	24	24	23	24	24
Benchmarking Participants																															
Quebec, Canada	58 (0.6)	57	58	56	58	58	58	58	55	58	60	59	58	58	58	57	60	57	59	58	60	59	59	58	60	61	56	60	58	58	57
Ontario, Canada	54 (0.8)	53	53	52	53	53	55	53	49	54	55	55	55	55	54	54	57	53	56	54	55	56	55	55	55	56	51	55	55	54	52
Alberta, Canada	51 (0.6)	50	50	49	50	50	51	50	46	51	53	52	51	52	51	51	53	50	52	51	53	53	52	51	53	53	48	52	51	51	49
Dubai, UAE	44 (0.4)	44	44	42	44	44	45	44	42	44	46	45	44	44	44	43	45	44	45	44	46	45	44	44	45	45	42	45	44	44	43
Abu Dhabi, UAE	34 (0.8)	34	33	32	35	33	34	34	31	34	35	34	34	34	34	34	35	34	35	34	35	35	34	34	35	35	32	34	34	34	32
Number of Items (Score Points) Identified*	184	158	138	134	111	127	170	163	65	178	160	169	179	158	170	154	146	171	164	169	145	162	146	176	132	138	119	156	158	181	120

* Of the 175 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 185 score points. Following item review, response categories for one of the items were combined, resulting in 184 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

Appendix F.1: Average Percent Correct for the Test-Curriculum Matching Analysis (Continued)

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.

Romania	New Zealand	Spain	Poland	Turkey	Azerbaijan	Chile	Thailand	Armenia	United Arab Emirates	Iran, Islamic Rep. of	Qatar	Oman	Tunisia	Morocco	Kuwait	Yemen	Botswana (6)	Yemen (6)
74	75	75	74	74	74	75	74	74	75	74	74	74	75	75	75	76	75	75
74	76	75	74	74	75	76	74	74	75	73	74	74	76	75	75	77	74	76
75	76	75	74	75	75	76	74	74	75	75	74	74	74	75	75	75	74	75
71	71	71	69	70	71	71	71	71	72	70	71	71	72	71	71	75	71	73
70	71	70	68	70	70	71	70	70	71	69	70	70	71	70	71	72	70	72
65	66	65	64	65	65	67	65	65	66	65	65	65	64	66	66	66	65	66
62	63	62	61	62	62	63	62	62	63	62	62	62	62	63	63	64	62	63
61	62	61	61	61	63	63	61	61	62	61	61	61	64	61	61	62	61	62
61	62	61	59	60	61	63	60	60	61	60	60	60	60	61	61	59	60	60
61	62	60	59	60	61	63	60	60	61	61	60	60	61	61	61	61	60	61
61	62	60	58	60	60	61	60	60	61	59	60	60	60	61	60	59	60	61
59	60	59	57	59	59	60	59	59	60	58	59	58	59	59	59	58	59	59
59	60	59	56	58	60	60	59	59	60	57	59	58	60	59	59	59	59	60
58	60	59	56	58	60	60	59	59	60	57	59	58	61	60	59	58	59	59
59	60	59	57	58	59	60	58	58	60	58	58	58	59	59	59	58	58	59
58	58	57	55	57	59	58	57	57	58	55	57	57	60	58	58	55	57	58
57	59	57	55	56	57	60	56	56	58	57	56	56	56	57	57	58	57	57
56	56	55	55	55	57	58	55	55	56	56	55	55	57	56	56	55	55	56
55	56	55	52	54	55	57	54	54	55	54	54	54	54	55	55	53	54	55
55	55	54	54	54	56	57	54	54	55	55	54	54	57	55	55	56	54	56
55	56	54	53	54	56	56	53	53	55	53	53	53	55	55	54	52	53	54
54	54	53	52	53	55	55	52	52	54	52	52	52	57	54	53	52	52	53
53	53	52	52	52	53	55	52	52	53	52	52	52	54	53	53	53	52	53
53	53	52	51	52	54	54	52	52	53	51	52	52	56	53	52	53	52	53
52	53	52	51	52	54	54	52	52	53	51	52	51	54	53	52	52	52	53
52	52	52	52	51	53	53	52	52	53	53	52	52	55	52	52	54	52	52
51	52	50	47	50	51	52	50	50	51	48	50	50	53	50	50	49	50	51
50	51	50	47	49	50	52	49	49	51	49	49	49	49	50	50	49	49	50
49	51	49	47	49	50	51	48	48	50	48	48	48	49	49	49	48	49	49
49	49	48	47	48	50	50	48	48	49	48	48	48	54	49	48	50	48	50
49	49	48	48	48	49	50	47	47	49	48	47	48	50	49	48	49	47	48
47	49	47	44	46	47	49	46	46	47	46	46	46	46	47	47	45	46	47
46	47	45	44	45	46	49	45	45	46	45	45	45	48	46	46	46	45	46
47	47	45	45	45	47	47	45	45	47	44	45	45	49	46	45	46	45	46
45	46	45	44	45	46	47	45	45	46	45	45	45	47	45	46	47	45	46
43	44	44	45	43	45	45	43	43	45	45	43	43	45	45	44	48	44	45
43	44	42	40	41	43	45	41	41	42	41	41	41	42	42	42	41	41	42
41	42	41	39	40	42	42	41	41	42	39	41	40	42	41	41	42	41	41
40	41	40	42	40	41	42	40	40	41	42	40	40	42	41	41	44	40	41
38	39	37	36	37	38	39	37	37	38	37	37	37	38	38	38	38	37	38
37	38	37	38	37	38	39	37	37	37	39	37	37	37	38	37	40	37	37
34	35	34	33	34	35	36	34	34	35	34	34	34	35	34	35	35	34	35
30	31	30	29	30	30	31	30	30	30	30	30	29	29	30	30	31	30	30
25	25	25	26	25	26	26	25	25	26	26	25	25	26	26	25	28	25	26
23	24	24	23	23	24	25	24	24	24	24	24	23	22	25	24	25	23	23
23	24	23	22	23	24	24	23	23	24	23	23	23	23	23	24	24	23	24
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	19	16	17
51	52	51	50	50	51	52	50	50	51	50	50	50	52	51	51	51	50	51
35	36	35	33	35	35	36	35	35	36	35	35	34	35	35	35	35	35	35
24	24	24	23	23	24	24	24	24	24	23	24	24	25	24	24	26	24	25

Benchmarking Participants

Quebec, Canada	Ontario, Canada	Alberta, Canada	Dubai, UAE	Abu Dhabi, UAE	Average Percent Correct on All Items	Country
75	74	74	74	74	74 (0.7)	Singapore
76	75	73	74	75	74 (0.4)	Korea, Rep. of
75	75	74	74	75	74 (0.8)	Hong Kong SAR
71	71	70	71	71	71 (0.4)	Chinese Taipei
71	71	70	70	71	70 (0.4)	Japan
66	65	65	65	65	65 (0.6)	Northern Ireland
64	62	60	62	63	62 (0.5)	Belgium (Flemish)
63	61	60	61	62	61 (0.9)	Russian Federation
62	61	60	60	61	60 (0.8)	England
61	61	60	60	61	60 (0.5)	United States
62	60	59	60	61	60 (0.6)	Finland
60	59	58	59	59	59 (0.6)	Denmark
60	58	59	59	59	59 (0.4)	Netherlands
61	59	58	59	59	59 (0.8)	Portugal
60	58	58	58	59	58 (0.6)	Lithuania
59	57	56	57	58	57 (0.6)	Germany
58	57	57	56	57	56 (0.6)	Ireland
57	55	54	55	56	55 (0.7)	Hungary
56	55	54	54	55	54 (0.6)	Australia
56	54	54	54	55	54 (0.7)	Serbia
57	54	53	53	55	53 (0.5)	Slovenia
55	53	51	52	54	52 (0.6)	Czech Republic
54	52	51	52	53	52 (0.7)	Italy
54	52	51	52	53	52 (0.8)	Slovak Republic
53	52	51	52	52	52 (0.7)	Austria
53	51	51	52	52	52 (1.1)	Kazakhstan
52	51	50	50	51	50 (0.5)	Sweden
51	50	50	49	50	49 (0.3)	Malta
50	50	48	48	49	48 (0.7)	Norway
50	48	45	48	49	48 (0.4)	Croatia
49	48	47	47	48	47 (1.2)	Romania
47	47	46	46	47	46 (0.5)	New Zealand
47	46	44	45	46	45 (0.6)	Spain
48	45	44	45	47	45 (0.5)	Poland
46	45	45	45	46	45 (0.8)	Turkey
44	43	44	43	44	43 (1.2)	Azerbaijan
43	42	41	41	43	41 (0.5)	Chile
42	41	41	41	41	41 (1.0)	Thailand
41	40	39	40	41	40 (0.8)	Armenia
38	37	37	37	38	37 (0.4)	United Arab Emirates
38	37	36	37	37	37 (0.7)	Iran, Islamic Rep. of
35	34	34	34	35	34 (0.6)	Qatar
30	30	29	30	30	30 (0.4)	Oman
26	25	24	25	25	25 (0.5)	Tunisia
24	24	23	24	23	24 (0.6)	Morocco
24	23	23	23	24	23 (0.4)	Kuwait
16	16	16	16	16	16 (0.4)	Yemen
52	51	50	50	51	50 (0.1)	International Avg.
35	35	35	35	35	35 (0.7)	Botswana (6)
24	23	23	24	24	24 (0.6)	Yemen (6)

Benchmarking Participants

60	59	58	58	59	58 (0.6)	Quebec, Canada
56	56	55	54	55	54 (0.8)	Ontario, Canada
53	52	52	51	52	51 (0.6)	Alberta, Canada
45	44	44	44	45	44 (0.4)	Dubai, UAE
35	34	34	34	35	34 (0.8)	Abu Dhabi, UAE

165	159	182	127	179	168	135	184	184	159	139	184	178	117	150	169	109	182	162

152	153	138	184	158	184	Number of Items (Score Points) Identified*

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

Appendix F.2: Average Percent Correct for the Test-Curriculum Matching Analysis

TIMSS 2011 8th Grade Mathematics

Based on a subset of items specifically identified by each country as addressing its curriculum

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	Korea, Rep. of	Singapore	Chinese Taipei	Hong Kong SAR	Japan	Russian Federation	Israel	Finland	Hungary	United States	England	Australia	Slovenia	Lithuania	Italy	New Zealand	Kazakhstan	Ukraine	Sweden	Norway	Armenia	Turkey	Romania	United Arab Emirates	Lebanon	Malaysia	Macedonia, Rep. of	Thailand	Qatar	Iran, Islamic Rep. of
Korea, Rep. of	74 (0.5)	75	74	74	74	75	76	74	75	74	74	74	74	75	74	76	74	74	75	74	74	74	74	75	74	74	75	74	74	74	74
Singapore	73 (0.9)	74	74	74	74	74	75	74	74	74	74	73	73	75	74	75	74	74	74	74	74	73	73	75	74	74	74	73	73	74	74
Chinese Taipei	72 (0.6)	73	72	73	72	72	73	72	72	72	72	72	72	73	72	73	72	72	72	72	72	72	72	73	72	73	71	72	72	72	72
Hong Kong SAR	68 (0.9)	69	68	69	68	69	70	68	69	68	68	68	68	70	68	70	69	68	69	68	69	68	68	69	69	69	70	68	68	68	69
Japan	64 (0.6)	65	64	64	65	66	66	64	65	64	64	64	65	65	64	66	65	64	65	65	65	64	64	65	64	64	66	64	64	64	64
Russian Federation	56 (0.9)	57	57	57	57	56	59	56	57	56	56	56	56	58	57	58	57	56	57	56	57	56	56	58	56	57	56	56	56	56	57
Israel	51 (1.0)	51	51	51	51	52	53	51	51	51	52	51	51	52	51	53	52	51	52	52	52	51	51	52	52	51	52	51	51	51	51
Finland	49 (0.7)	50	49	49	49	51	52	49	51	50	50	49	50	52	50	52	51	49	51	51	52	49	49	50	50	50	54	49	49	50	49
Hungary	49 (0.8)	49	49	49	48	49	52	48	49	49	49	49	49	51	49	51	50	48	50	49	50	49	49	50	49	49	52	49	49	49	49
United States	48 (0.7)	49	48	48	48	50	51	48	49	48	49	49	49	50	48	51	50	49	49	49	50	48	48	49	50	48	51	48	48	49	48
England	48 (1.4)	49	48	48	48	50	50	48	49	48	49	49	49	50	48	51	50	48	49	50	50	48	48	48	50	48	53	48	48	49	48
Australia	48 (1.3)	48	47	47	47	49	50	47	48	48	48	48	48	49	48	50	49	48	49	49	50	48	48	48	49	48	52	48	48	48	47
Slovenia	47 (0.5)	48	47	47	47	48	50	47	48	47	47	47	47	49	47	50	48	47	48	48	49	47	47	48	48	48	51	47	47	48	47
Lithuania	47 (0.6)	47	47	47	46	48	50	47	48	47	47	47	47	49	47	50	48	46	48	48	48	47	47	48	47	48	50	47	47	47	46
Italy	46 (0.6)	46	46	46	46	46	48	46	47	46	46	46	46	48	46	49	47	46	47	46	47	46	46	47	47	47	49	46	46	46	46
New Zealand	44 (1.4)	44	43	43	43	45	46	43	45	44	44	44	44	45	44	46	45	44	45	45	46	44	44	44	45	44	48	44	44	44	43
Kazakhstan	43 (1.0)	43	43	43	43	43	45	42	43	43	43	43	43	44	43	44	43	43	44	42	43	43	43	45	43	44	43	43	43	43	44
Ukraine	42 (0.9)	42	42	42	42	42	45	42	43	42	42	42	42	43	42	44	43	42	43	42	42	42	42	43	42	43	43	42	42	42	42
Sweden	41 (0.5)	42	41	41	41	43	44	42	42	41	42	42	42	43	42	44	43	41	42	44	43	41	41	42	43	42	46	41	41	42	41
Norway	39 (0.6)	40	39	38	38	41	41	39	40	39	40	39	40	41	39	42	41	39	40	41	41	39	39	39	40	39	46	39	39	40	38
Armenia	38 (0.6)	39	39	39	39	39	41	39	39	39	39	38	39	40	39	40	39	39	39	38	38	38	38	41	39	40	37	38	38	38	40
Turkey	38 (0.8)	38	38	37	37	38	39	38	38	38	38	38	38	39	38	40	39	38	38	38	39	38	38	38	38	38	40	38	38	38	38
Romania	38 (0.8)	38	38	38	38	38	40	38	38	38	38	38	38	39	38	39	39	38	39	38	38	38	38	39	38	39	38	38	38	38	38
United Arab Emirates	37 (0.5)	37	37	37	37	37	39	37	37	37	37	37	37	38	37	39	38	37	38	37	38	37	37	38	37	37	38	37	37	37	37
Lebanon	34 (0.8)	35	35	35	35	35	38	34	35	35	34	34	35	36	35	37	35	34	36	34	34	34	34	37	34	36	34	34	34	35	36
Malaysia	34 (1.0)	35	35	35	35	35	37	34	35	34	34	34	34	36	35	37	35	34	35	35	35	34	34	36	35	35	37	34	34	34	35
Macedonia, Rep. of	32 (0.9)	33	33	33	32	33	35	33	33	33	33	32	32	34	33	34	33	32	33	33	33	32	32	34	33	33	33	32	32	33	33
Thailand	31 (0.9)	31	31	31	31	31	33	31	32	31	31	31	31	33	31	33	32	31	32	31	32	31	31	32	31	31	33	31	31	31	31
Qatar	30 (0.5)	31	30	30	30	31	32	30	31	30	31	30	31	31	30	32	31	30	31	30	31	30	30	31	31	31	31	30	30	31	31
Iran, Islamic Rep. of	30 (0.8)	30	30	30	29	30	32	29	30	30	30	29	30	31	30	31	30	30	30	29	30	30	30	31	30	30	31	30	30	30	31
Tunisia	29 (0.6)	30	29	29	29	30	31	29	30	29	29	29	30	31	29	31	30	29	30	29	30	29	29	30	30	30	31	29	29	30	30
Palestinian Nat'l Auth.	29 (0.6)	29	29	29	29	29	31	29	29	29	29	29	29	30	29	30	29	29	29	28	29	29	29	30	29	29	30	29	29	29	30
Jordan	29 (0.5)	29	29	29	29	29	31	29	29	29	29	29	29	30	29	30	29	29	29	28	29	29	29	30	29	29	29	29	29	29	29
Chile	28 (0.4)	29	29	28	28	29	31	28	29	29	29	29	29	30	29	31	30	29	29	29	30	28	28	29	29	29	31	28	28	29	29
Oman	24 (0.3)	24	24	24	24	25	26	24	25	24	24	24	24	25	24	25	25	24	25	24	25	24	24	25	24	24	25	24	24	24	24
Morocco	22 (0.2)	23	22	23	23	23	25	22	23	22	22	22	22	23	22	24	23	22	23	22	23	22	22	24	22	23	24	22	22	22	23
International Avg.	43 (0.1)	44	43	43	43	44	45	43	44	43	43	43	43	45	43	45	44	43	44	44	44	43	43	44	44	44	45	43	43	43	43
Botswana (9)	25 (0.4)	26	25	25	25	26	27	25	26	25	25	25	25	26	25	27	26	25	26	25	26	25	25	26	26	25	27	25	25	26	26
South Africa (9)	20 (0.4)	20	20	20	20	21	22	20	21	20	21	20	20	21	20	22	21	20	21	21	21	20	20	21	21	21	22	20	20	20	21
Benchmarking Participants																															
Quebec, Canada	54 (0.7)	55	54	54	54	56	57	54	56	54	54	54	55	56	54	57	56	54	55	56	56	54	54	55	55	55	58	54	54	55	54
Ontario, Canada	49 (0.6)	49	49	49	48	50	51	49	50	49	49	49	50	51	49	52	51	49	50	50	51	49	49	48	51	49	54	49	49	50	49
Alberta, Canada	47 (0.7)	47	47	46	47	48	49	47	48	47	47	47	48	48	47	50	48	47	48	49	49	47	47	47	49	47	52	47	47	47	46
Dubai, UAE	42 (0.5)	42	42	42	42	42	44	42	42	42	42	42	42	43	42	44	43	42	43	42	43	42	42	43	43	43	43	42	42	42	42
Abu Dhabi, UAE	35 (0.8)	35	35	35	35	36	37	35	36	35	36	35	36	36	35	37	36	35	36	35	36	35	35	36	36	35	37	35	35	35	35
Number of Items (Score Points) Identified*	230	219	209	212	211	205	191	220	218	227	218	222	211	208	212	200	217	224	211	193	209	230	230	185	198	197	163	230	230	218	199

* Of the 217 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 232 score points. Following item review, response categories for two of the items were combined, resulting in 230 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

Appendix F.2: Average Percent Correct for the Test-Curriculum Matching Analysis (Continued)

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.

Tunisia	Palestinian Nat'l Auth.	Jordan	Chile	Oman	Morocco	Botswana (9)	South Africa (9)	Benchmarking Participants	Quebec, Canada	Ontario, Canada	Alberta, Canada	Dubai, UAE	Abu Dhabi, UAE	Average Percent Correct on All Items	Country
74	75	76	74	74	75	73	73		75	75	74	74	73	74 (0.5)	Korea, Rep. of
75	75	76	74	74	75	73	73		74	74	74	73	73	73 (0.9)	Singapore
73	73	74	72	72	73	72	72		72	72	72	72	72	72 (0.6)	Chinese Taipei
69	70	71	69	69	69	68	68		69	69	69	68	68	68 (0.9)	Hong Kong SAR
65	65	67	65	65	65	64	64		65	65	65	64	64	64 (0.6)	Japan
57	58	60	55	57	58	56	56		57	57	56	56	56	56 (0.9)	Russian Federation
52	53	55	52	52	52	50	51		51	52	52	51	51	51 (1.0)	Israel
50	51	53	53	50	51	48	49		51	52	51	49	49	49 (0.7)	Finland
50	50	52	51	49	50	48	48		49	50	50	49	49	49 (0.8)	Hungary
49	50	52	50	49	49	48	48		49	51	50	48	49	48 (0.7)	United States
49	50	51	52	49	49	47	48		49	51	50	48	48	48 (1.4)	England
49	49	51	51	49	48	46	47		49	51	49	48	48	48 (1.3)	Australia
48	49	51	50	48	48	46	47		48	50	48	47	47	47 (0.5)	Slovenia
48	49	50	48	48	48	46	46		47	48	48	47	47	47 (0.6)	Lithuania
47	48	50	48	47	47	45	46		46	48	47	46	46	46 (0.6)	Italy
45	45	47	47	45	44	43	44		45	47	45	44	44	44 (1.4)	New Zealand
43	44	46	41	43	44	42	42		43	43	43	43	43	43 (1.0)	Kazakhstan
42	43	46	41	43	43	41	42		42	43	42	42	42	42 (0.9)	Ukraine
42	44	45	46	42	43	41	41		42	44	43	41	41	41 (0.5)	Sweden
40	41	42	44	40	40	38	39		40	42	41	39	39	39 (0.6)	Norway
40	40	41	36	39	40	38	38		39	38	38	38	38	38 (0.6)	Armenia
38	39	41	39	39	38	37	38		38	39	39	38	38	38 (0.8)	Turkey
38	39	41	37	38	39	37	38		38	38	38	38	38	38 (0.8)	Romania
38	38	41	37	38	37	36	37		37	38	37	37	37	37 (0.5)	United Arab Emirates
35	36	38	33	35	36	34	34		35	34	34	34	34	34 (0.8)	Lebanon
35	36	38	36	35	36	34	34		35	36	35	34	34	34 (1.0)	Malaysia
33	34	36	32	33	33	32	32		33	33	33	32	33	32 (0.9)	Macedonia, Rep. of
31	32	35	32	32	32	30	31		32	33	32	31	31	31 (0.9)	Thailand
31	32	34	31	31	31	30	30		31	31	31	30	30	30 (0.5)	Qatar
30	31	33	30	30	30	29	29		30	31	30	30	30	30 (0.8)	Iran, Islamic Rep. of
30	30	33	30	30	30	29	29		30	31	30	29	29	29 (0.6)	Tunisia
29	30	33	29	29	29	28	29		29	30	29	29	29	29 (0.6)	Palestinian Nat'l Auth.
29	30	33	28	29	29	28	29		29	29	29	29	29	29 (0.5)	Jordan
29	30	32	31	29	29	28	28		29	30	29	28	29	28 (0.4)	Chile
24	25	27	24	25	24	24	24		24	25	24	24	24	24 (0.3)	Oman
23	23	25	23	23	23	22	22		23	23	22	22	22	22 (0.2)	Morocco
44	45	47	44	44	44	43	43		44	45	44	43	43	43 (0.1)	International Avg.
26	26	29	27	26	26	25	25		26	27	26	25	25	25 (0.4)	Botswana (9)
21	21	23	21	21	21	20	20		21	21	21	20	20	20 (0.4)	South Africa (9)
															Benchmarking Participants
56	56	57	57	55	56	53	54		56	57	56	54	54	54 (0.7)	Quebec, Canada
50	51	52	53	50	50	48	49		50	53	51	49	49	49 (0.6)	Ontario, Canada
48	48	50	51	48	48	46	47		48	50	49	47	47	47 (0.7)	Alberta, Canada
43	44	46	42	43	43	41	42		42	43	43	42	42	42 (0.5)	Dubai, UAE
36	37	39	36	36	36	35	35		35	37	36	35	35	35 (0.8)	Abu Dhabi, UAE
191	203	182	172	214	197	216	228		215	200	206	230	224	230	Number of Items (Score Points) Identified*

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

analyzed to determine whether the inclusion of these items had any effect on the international performance comparisons.[4]

The first column of data in Exhibits F.1 and F.2 show 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 these exhibits, 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 75 percent on its own set of items, had 74 percent correct on the items selected by Korea and Hong Kong SAR, 75 percent on the items selected by Chinese Taipei, 74 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 on the set of items selected as appropriate for that country's students. Using the set of items selected by the England as an example, 75 percent of these items, on average, were answered correctly by students in Singapore, 74 percent by students in Korea and Hong Kong SAR, 71 percent by students in Chinese Taipei, 70 percent by students in Japan, 65 percent by those in Northern Ireland, 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 England 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 selections of items by the participating countries varied somewhat in average difficulty, ranging at the fourth grade from 49 percent correct, for those chosen by Hong Kong SAR, to 53 percent correct for those chosen by Austria. At the eighth grade, the average percent correct ranged from 43 percent, for many participants, to 47 percent for those chosen by Jordan.

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

4 It should be noted that the mathematics achievement presented in Exhibits F.1 and F.2 is based on average percent correct (the percentage of students in a country, averaged across all items), which is different from the average scale scores that are presented in Chapter 1.

than on the items overall, although not by much. To illustrate, the average percent correct for Singapore across all fourth grade mathematics items was 74 percent. The diagonal element shows that students from Singapore had a slightly greater average percent correct (75 percent) across the set of items selected as appropriate for Singapore than they did overall. Most participants had a difference of one or two percentage points between the two performance measures, with the largest differences in the Slovak Republic (5 percentage points). At the eighth grade, the differences were generally smaller; the largest being in Jordan and the province of Ontario (4 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 eighth grade, Korea 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 Singapore, Chinese Taipei, Hong Kong SAR 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 changed little. As an example, consider the 162 score points selected by the Slovenia at the fourth grade. The students in the Slovenia did better on these items (56% correct) than on the test as a whole (53% correct). However, most other countries also did better on these particular items, with an international average of 51 percent correct compared with 50 percent correct overall. The countries that performed better than the Slovenia on the overall test also performed as well or better on the items selected by the Slovenia.

The TCMA results provide evidence that the TIMSS 2011 mathematics assessment provides a reasonable basis for comparing achievement of the participating countries and benchmarking entities. This result is not unexpected; 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

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 2011 sample are provided in Exhibits F.3 and F.4. For any sample average shown in Exhibits F.1 and F.2, 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.

Appendix F.3: Standard Errors for the Test-Curriculum Matching Analysis

TIMSS 2011 Mathematics 4th Grade

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	Korea, Rep. of	Hong Kong SAR	Chinese Taipei	Japan	Northern Ireland	Belgium (Flemish)	Russian Federation	England	United States	Finland	Denmark	Netherlands	Portugal	Lithuania	Germany	Ireland	Hungary	Australia	Serbia	Slovenia	Czech Republic	Italy	Slovak Republic	Austria	Kazakhstan	Sweden	Malta	Norway	Croatia
Singapore	74 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Korea, Rep. of	74 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Hong Kong SAR	74 (0.8)	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Chinese Taipei	71 (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	0.4	0.4	0.4
Japan	70 (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	0.3	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
Northern Ireland	65 (0.6)	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	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.7
Belgium (Flemish)	62 (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	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
Russian Federation	61 (0.9)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8
England	60 (0.8)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	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	0.8	0.9	0.8	0.8	0.8	0.9
United States	60 (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	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Finland	60 (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	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
Denmark	59 (0.6)	0.7	0.6	0.7	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	0.7	0.6	0.6	0.6	0.6
Netherlands	59 (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	0.5	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	0.5
Portugal	59 (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	0.8	0.8	0.8
Lithuania	58 (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	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
Germany	57 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Ireland	56 (0.6)	0.6	0.7	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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hungary	55 (0.7)	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.7	0.7	0.8	0.7	0.7
Australia	54 (0.6)	0.7	0.7	0.7	0.7	0.7	0.6	0.7	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	0.6	0.6	0.6	0.6	0.6
Serbia	54 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Slovenia	53 (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	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
Czech Republic	52 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Italy	52 (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	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Slovak Republic	52 (0.8)	0.9	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	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
Austria	52 (0.7)	0.7	0.7	0.7	0.8	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	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Kazakhstan	52 (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	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Sweden	50 (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	0.5	0.5	0.5
Malta	49 (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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Norway	48 (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	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Croatia	48 (0.4)	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5
Romania	47 (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	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
New Zealand	46 (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	0.5	0.5	0.5
Spain	45 (0.6)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	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	0.6	0.6
Poland	45 (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	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
Turkey	45 (0.8)	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.9	0.8	0.9
Azerbaijan	43 (1.2)	1.3	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.3	1.2	1.2	1.2
Chile	41 (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	0.5	0.5	0.5
Thailand	41 (1.0)	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1	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
Armenia	40 (0.8)	0.8	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.8
United Arab Emirates	37 (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	0.4	0.4	0.4
Iran, Islamic Rep. of	37 (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	0.7	0.7	0.7	0.7	0.7	0.7
Qatar	34 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Oman	30 (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	0.4	0.4	0.4
Tunisia	25 (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	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
Morocco	24 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Kuwait	23 (0.4)	0.4	0.3	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	0.3	0.4	0.4	0.4	0.4
Yemen	16 (0.4)	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4
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	0.1	0.1	0.1	0.1
Botswana (6)	35 (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	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	0.8	0.7	0.7
Yemen (6)	24 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Benchmarking Participants																															
Quebec, Canada	58 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7
Ontario, Canada	54 (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	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.7
Alberta, Canada	51 (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	0.7	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	0.7	0.6	0.6
Dubai, UAE	44 (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	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Abu Dhabi, UAE	34 (0.8)	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.9
Number of Items (Score Points) Identified*	184	158	138	134	111	127	170	163	65	178	160	169	179	158	170	154	146	171	164	169	145	162	146	176	132	138	119	156	158	181	120

* Of the 175 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 185 score points. Following item review, response categories for one of the items were combined, resulting in 184 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

Appendix F.3: Standard Errors for the Test-Curriculum Matching Analysis (Continued)

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.

Romania	New Zealand	Spain	Poland	Turkey	Azerbaijan	Chile	Thailand	Armenia	United Arab Emirates	Iran, Islamic Rep. of	Qatar	Oman	Tunisia	Morocco	Kuwait	Yemen	Botswana (6)	Yemen (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
0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.7	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
0.4	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	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4
0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.7	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
0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8
0.8	0.8	0.8	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
0.5	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	0.6	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	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6
0.4	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	0.4	0.4	0.4
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
0.6	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
0.6	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
0.6	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
0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7
0.6	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	0.6	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	0.7	0.7	0.7	0.7	0.7
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	0.6	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	0.7	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	0.7	0.7	0.7
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	0.8	0.8	0.8	0.8	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	0.7	0.7	0.7	0.8	0.7	0.8
1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
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
0.3	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
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	0.7	0.7	0.7
0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4
1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.2
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	0.6	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	0.6	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
0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2
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
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0
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
0.4	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
0.7	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
0.6	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	0.6
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	0.5	0.4	0.4	0.4	0.4	0.4
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	0.5	0.5	0.5	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	0.6	0.6	0.6	0.6	0.6	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	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.5
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
0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7
0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6

Benchmarking Participants

Quebec, Canada	Ontario, Canada	Alberta, Canada	Dubai, UAE	Abu Dhabi, UAE	Average Percent Correct on All Items	Country
0.7	0.7	0.7	0.7	0.7	74 (0.7)	Singapore
0.3	0.4	0.4	0.4	0.4	74 (0.4)	Korea, Rep. of
0.7	0.8	0.8	0.8	0.8	74 (0.8)	Hong Kong SAR
0.4	0.4	0.4	0.4	0.4	71 (0.4)	Chinese Taipei
0.4	0.4	0.4	0.4	0.4	70 (0.4)	Japan
0.6	0.6	0.7	0.6	0.7	65 (0.6)	Northern Ireland
0.5	0.5	0.5	0.5	0.5	62 (0.5)	Belgium (Flemish)
0.8	0.9	0.9	0.9	0.8	61 (0.9)	Russian Federation
0.8	0.8	0.8	0.8	0.8	60 (0.8)	England
0.5	0.5	0.5	0.5	0.5	60 (0.5)	United States
0.6	0.6	0.6	0.6	0.6	60 (0.6)	Finland
0.6	0.6	0.6	0.6	0.6	59 (0.6)	Denmark
0.4	0.4	0.4	0.4	0.4	59 (0.4)	Netherlands
0.8	0.8	0.8	0.8	0.8	59 (0.8)	Portugal
0.6	0.6	0.6	0.6	0.6	58 (0.6)	Lithuania
0.6	0.6	0.6	0.6	0.6	57 (0.6)	Germany
0.6	0.6	0.6	0.6	0.6	56 (0.6)	Ireland
0.8	0.8	0.7	0.7	0.8	55 (0.7)	Hungary
0.6	0.6	0.7	0.6	0.6	54 (0.6)	Australia
0.7	0.7	0.7	0.7	0.7	54 (0.7)	Serbia
0.5	0.5	0.5	0.5	0.5	53 (0.5)	Slovenia
0.6	0.6	0.6	0.6	0.6	52 (0.6)	Czech Republic
0.7	0.7	0.7	0.7	0.7	52 (0.7)	Italy
0.8	0.8	0.9	0.8	0.8	52 (0.8)	Slovak Republic
0.7	0.7	0.7	0.7	0.7	52 (0.7)	Austria
1.1	1.1	1.1	1.1	1.1	52 (1.1)	Kazakhstan
0.5	0.5	0.6	0.5	0.5	50 (0.5)	Sweden
0.3	0.3	0.3	0.3	0.3	49 (0.3)	Malta
0.7	0.7	0.7	0.7	0.7	48 (0.7)	Norway
0.5	0.4	0.4	0.4	0.4	48 (0.4)	Croatia
1.2	1.2	1.2	1.2	1.2	47 (1.2)	Romania
0.5	0.5	0.6	0.5	0.5	46 (0.5)	New Zealand
0.6	0.6	0.6	0.6	0.6	45 (0.6)	Spain
0.5	0.5	0.5	0.5	0.5	45 (0.5)	Poland
0.9	0.9	0.9	0.8	0.8	45 (0.8)	Turkey
1.2	1.3	1.2	1.2	1.2	43 (1.2)	Azerbaijan
0.5	0.5	0.5	0.5	0.5	41 (0.5)	Chile
1.0	1.0	1.0	1.0	1.0	41 (1.0)	Thailand
0.8	0.8	0.8	0.8	0.8	40 (0.8)	Armenia
0.4	0.4	0.4	0.4	0.4	37 (0.4)	United Arab Emirates
0.7	0.7	0.7	0.7	0.7	37 (0.7)	Iran, Islamic Rep. of
0.6	0.6	0.6	0.6	0.6	34 (0.6)	Qatar
0.4	0.4	0.4	0.4	0.4	30 (0.4)	Oman
0.5	0.5	0.5	0.5	0.5	25 (0.5)	Tunisia
0.6	0.6	0.6	0.6	0.6	24 (0.6)	Morocco
0.4	0.4	0.4	0.4	0.4	23 (0.4)	Kuwait
0.4	0.4	0.4	0.4	0.5	16 (0.4)	Yemen
0.1	0.1	0.1	0.1	0.1	50 (0.1)	International Avg.
0.8	0.7	0.7	0.7	0.7	35 (0.7)	Botswana (6)
0.6	0.6	0.6	0.6	0.6	24 (0.6)	Yemen (6)

Benchmarking Participants

0.6	0.6	0.7	0.6	0.6	58 (0.6)	Quebec, Canada
0.8	0.8	0.8	0.8	0.8	54 (0.8)	Ontario, Canada
0.6	0.6	0.7	0.6	0.7	51 (0.6)	Alberta, Canada
0.4	0.4	0.4	0.4	0.4	44 (0.4)	Dubai, UAE
0.9	0.9	0.8	0.8	0.9	34 (0.8)	Abu Dhabi, UAE

165	159	182	127	179	168	Number of Items (Score Points) Identified*
135	184	184	159	139	184	
178	117	150	169	109	182	
162	152	153	138	184	158	
					184	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

Appendix F.4: Standard Errors for the Test-Curriculum Matching Analysis

TIMSS 2011 Mathematics 8th Grade

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	Korea, Rep. of	Singapore	Chinese Taipei	Hong Kong SAR	Japan	Russian Federation	Israel	Finland	Hungary	United States	England	Australia	Slovenia	Lithuania	Italy	New Zealand	Kazakhstan	Ukraine	Sweden	Norway	Armenia	Turkey	Romania	United Arab Emirates	Lebanon	Malaysia	Macedonia, Rep. of	Thailand	Qatar	Iran, Islamic Rep. of
Korea, Rep. of	74 (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	0.6	0.5	0.5	0.5	0.5	0.5
Singapore	73 (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	0.9	0.9	0.9
Chinese Taipei	72 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hong Kong SAR	68 (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	0.8	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9
Japan	64 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Russian Federation	56 (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	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Israel	51 (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	0.9	1.0	1.0	1.0	1.0
Finland	49 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6
Hungary	49 (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	0.8	0.8	0.8
United States	48 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
England	48 (1.4)	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.4	1.4	1.4	1.4	1.5	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4
Australia	48 (1.3)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3
Slovenia	47 (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	0.5	0.5	0.5
Lithuania	47 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Italy	46 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
New Zealand	44 (1.4)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Kazakhstan	43 (1.0)	1.0	1.1	1.1	1.1	1.0	1.1	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.1
Ukraine	42 (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	0.9	0.9	0.9
Sweden	41 (0.5)	0.5	0.5	0.4	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	0.4	0.5	0.5	0.5	0.5	0.5	0.4
Norway	39 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6
Armenia	38 (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	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Turkey	38 (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	0.8	0.8	0.8
Romania	38 (0.8)	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.9
United Arab Emirates	37 (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	0.4	0.5	0.5	0.5	0.5
Lebanon	34 (0.8)	0.8	0.9	0.9	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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8
Malaysia	34 (1.0)	1.0	1.1	1.1	1.1	1.0	1.1	1.0	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.1
Macedonia, Rep. of	32 (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	0.9	0.9	0.9
Thailand	31 (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	0.9	0.9	0.9
Qatar	30 (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	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Iran, Islamic Rep. of	30 (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	0.8	0.8	0.8
Tunisia	29 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Palestinian Nat'l Auth.	29 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Jordan	29 (0.5)	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.6	0.5
Chile	28 (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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4
Oman	24 (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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Morocco	22 (0.2)	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2
International Avg.	43 (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	0.1	0.1	0.1
Botswana (9)	25 (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	0.4	0.4	0.4
South Africa (9)	20 (0.4)	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Benchmarking Participants																															
Quebec, Canada	54 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Ontario, Canada	49 (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	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6
Alberta, Canada	47 (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	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Dubai, UAE	42 (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	0.5	0.5	0.5	0.5	0.5
Abu Dhabi, UAE	35 (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	0.8	0.8	0.8
Number of Items (Score Points) Identified*	230	219	209	212	211	205	191	220	218	227	218	222	211	208	212	200	217	224	211	193	209	230	230	185	198	197	163	230	230	218	199

* Of the 217 items in the Mathematics test, some extended-response items were scored on a two-point scale, resulting in 232 score points. Following item review, response categories for two of the items were combined, resulting in 230 score points.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

Appendix F.4: Standard Errors for the Test-Curriculum Matching Analysis (Continued)

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.

Tunisia	Palestinian Nat'l Auth.	Jordan	Chile	Oman	Morocco	Botswana (9)	South Africa (9)	Benchmarking Participants	Quebec, Canada	Ontario, Canada	Alberta, Canada	Dubai, UAE	Abu Dhabi, UAE	Average Percent Correct on All Items	Country
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	74 (0.5)	Korea, Rep. of
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	73 (0.9)	Singapore
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	72 (0.6)	Chinese Taipei
0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9		0.9	0.8	0.8	0.9	0.9	68 (0.9)	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	0.6	64 (0.6)	Japan
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	56 (0.9)	Russian Federation
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)	Israel
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	49 (0.7)	Finland
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	49 (0.8)	Hungary
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	48 (0.7)	United States
1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.4		1.4	1.5	1.5	1.4	1.4	48 (1.4)	England
1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3		1.3	1.3	1.3	1.3	1.3	48 (1.3)	Australia
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	47 (0.5)	Slovenia
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	47 (0.6)	Lithuania
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	46 (0.6)	Italy
1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		1.4	1.4	1.4	1.4	1.4	44 (1.4)	New Zealand
1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.0		1.0	1.0	1.0	1.0	1.0	43 (1.0)	Kazakhstan
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	42 (0.9)	Ukraine
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	41 (0.5)	Sweden
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	39 (0.6)	Norway
0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6		0.6	0.5	0.6	0.6	0.6	38 (0.6)	Armenia
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	38 (0.8)	Turkey
0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.8		0.8	0.8	0.8	0.8	0.8	38 (0.8)	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	37 (0.5)	United Arab Emirates
0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.8		0.8	0.8	0.8	0.8	0.8	34 (0.8)	Lebanon
1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0		1.1	1.1	1.1	1.0	1.0	34 (1.0)	Malaysia
0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9		0.9	0.9	0.9	0.9	0.9	32 (0.9)	Macedonia, Rep. of
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	31 (0.9)	Thailand
0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5		0.5	0.5	0.5	0.5	0.5	30 (0.5)	Qatar
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	30 (0.8)	Iran, Islamic Rep. of
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	29 (0.6)	Tunisia
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	29 (0.6)	Palestinian Nat'l Auth.
0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5		0.5	0.5	0.6	0.5	0.5	29 (0.5)	Jordan
0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.4		0.4	0.4	0.4	0.4	0.4	28 (0.4)	Chile
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	24 (0.3)	Oman
0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2		0.2	0.2	0.2	0.2	0.2	22 (0.2)	Morocco
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	43 (0.1)	International Avg.
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	25 (0.4)	Botswana (9)
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	20 (0.4)	South Africa (9)
Benchmarking Participants															
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	54 (0.7)	Quebec, Canada
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	49 (0.6)	Ontario, 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	47 (0.7)	Alberta, Canada
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	42 (0.5)	Dubai, UAE
0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8		0.8	0.8	0.8	0.8	0.8	35 (0.8)	Abu Dhabi, UAE
191	203	182	172	214	197	216	228		215	200	206	230	224	230	Number of Items (Score Points) Identified*

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2011

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.