

REFERENCE 3


Teachers and
Instruction

R

3



Exhibit R3.1 Teachers' Major Area of Study in Their BA, MA, or Teacher Training Certification*

		Percentage of Students Whose Teachers Report Having the Major Area of Study						
		Biology	Physics	Chemistry	Science Education	Mathematics or Mathematics Education	Education	Other
General/Integrated Science								
G	Australia	58 (4.2)	23 (2.9)	40 (3.2)	52 (3.2)	25 (3.0)	44 (3.6)	r 38 (3.6)
	Canada	36 (2.8)	8 (1.9)	17 (2.3)	28 (2.9)	11 (1.8)	51 (3.0)	67 (2.8)
	Chile	57 (3.5)	30 (3.8)	45 (3.6)	52 (4.0)	36 (3.6)	67 (3.6)	r 45 (3.9)
	Cyprus	52 (2.5)	64 (2.5)	49 (2.7)	21 (2.0)	x x	20 (2.1)	r 15 (1.4)
	England	s 49 (4.6)	s 47 (3.8)	s 54 (3.8)	s 54 (3.7)	s 25 (3.9)	s 44 (3.6)	s 35 (4.4)
	Hong Kong, SAR	26 (3.9)	15 (3.4)	29 (4.2)	47 (4.4)	33 (4.5)	38 (4.5)	30 (4.1)
	Iran, Islamic Rep.	4 (1.4)	3 (1.2)	3 (1.2)	66 (3.8)	3 (1.3)	1 (0.9)	6 (1.7)
	Israel	78 (4.5)	30 (5.0)	51 (5.4)	69 (4.5)	9 (2.8)	45 (5.2)	r 29 (5.8)
	Italy	61 (3.5)	3 (1.4)	5 (1.5)	--	23 (3.5)	0 (0.0)	16 (3.1)
	Japan	r 31 (4.7)	r 30 (4.5)	r 37 (4.7)	r 44 (5.0)	r 4 (1.8)	r 18 (3.2)	r 22 (4.0)
	Jordan	24 (3.9)	31 (3.8)	27 (3.8)	41 (4.7)	14 (3.2)	13 (3.2)	16 (3.6)
	Korea, Rep. of	27 (3.5)	24 (3.5)	28 (3.6)	38 (3.9)	1 (0.8)	10 (2.3)	10 (2.2)
	Malaysia	22 (3.2)	12 (2.8)	21 (3.7)	59 (4.4)	52 (4.4)	42 (4.2)	33 (3.8)
	New Zealand	48 (4.0)	15 (2.9)	31 (3.9)	7 (2.0)	16 (3.0)	14 (3.0)	37 (3.8)
	Philippines	38 (4.3)	12 (2.6)	14 (3.2)	44 (3.9)	18 (3.2)	24 (3.5)	34 (4.0)
	Singapore	48 (4.7)	20 (3.4)	53 (4.5)	46 (4.3)	49 (4.4)	40 (4.3)	r 29 (4.5)
	South Africa	52 (4.4)	41 (4.0)	36 (3.5)	29 (3.5)	62 (3.5)	66 (4.8)	45 (4.6)
	Thailand	23 (3.7)	5 (1.9)	12 (2.8)	49 (3.7)	6 (2.0)	11 (2.5)	26 (3.7)
	Tunisia	73 (3.8)	15 (2.6)	26 (3.5)	47 (4.0)	76 (3.8)	15 (3.1)	24 (4.1)
Turkey	37 (4.0)	36 (3.9)	34 (4.1)	52 (3.8)	13 (2.8)	22 (3.4)	9 (2.3)	
United States	47 (3.5)	13 (2.2)	21 (3.0)	43 (3.7)	14 (2.5)	56 (3.6)	r 45 (3.7)	
International Avg.	42 (0.8)	23 (0.7)	30 (0.8)	44 (0.9)	25 (0.7)	30 (0.7)	29 (0.8)	
Earth Science								
	Belgium (Flemish)	66 (5.5)	38 (4.4)	57 (5.6)	45 (4.1)	10 (2.8)	41 (4.2)	85 (3.3)
	Bulgaria	8 (2.2)	1 (0.6)	6 (2.0)	--	1 (1.2)	29 (6.3)	85 (6.5)
	Chinese Taipei	--	--	--	--	--	--	--
	Czech Republic	25 (5.3)	2 (1.5)	4 (2.0)	33 (5.1)	25 (4.0)	35 (5.6)	90 (3.3)
	Finland ^b	--	--	--	--	--	--	--
	Hungary	50 (4.3)	1 (0.7)	1 (0.7)	22 (3.6)	2 (1.2)	11 (2.7)	91 (2.6)
	Indonesia	--	--	--	--	--	--	--
	Latvia (LSS)	--	--	--	--	--	--	--
	Lithuania [†]	--	--	--	--	--	--	--
	Macedonia, Rep. of	12 (3.1)	9 (2.8)	8 (2.6)	75 (3.8)	9 (2.7)	52 (4.7)	49 (4.0)
	Moldova	37 (4.6)	6 (1.8)	21 (3.3)	x x	17 (3.3)	58 (4.7)	60 (4.7)
	Morocco	--	--	--	--	--	--	--
	Netherlands	3 (1.6)	2 (1.2)	1 (0.1)	1 (0.7)	1 (0.1)	4 (1.8)	85 (4.5)
	Romania	6 (2.3)	1 (0.7)	3 (1.6)	25 (4.3)	1 (0.3)	32 (4.5)	77 (4.1)
	Russian Federation	42 (4.1)	4 (1.8)	15 (2.8)	71 (4.1)	7 (2.7)	74 (4.0)	84 (3.2)
	International Avg.	28 (1.3)	7 (0.7)	13 (0.9)	39 (1.5)	8 (0.8)	37 (1.5)	79 (1.4)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Countries are classified as having either general/integrated science or separate subject area classes at grade 8. Teachers who responded that they majored in more than one subject are reflected in all categories that apply.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

^b Finland: Data for biology and biology/geography teachers are reported in biology panel; data for physics and physics/chemistry teachers are reported in physics panel. Small number of separate chemistry and geography teachers are not reported.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students. An "x" indicates teacher response data available for <50% of students.

	Percentage of Students Whose Teachers Report Having the Major Area of Study						
	Biology	Physics	Chemistry	Science Education	Mathematics or Mathematics Education	Education	Other
Biology							
Belgium (Flemish)	78 (4.3)	44 (4.9)	56 (4.7)	45 (4.6)	18 (3.7)	41 (4.9)	74 (4.6)
Bulgaria	93 (2.0)	3 (1.4)	30 (4.5)	--	0 (0.0)	16 (3.4)	7 (2.0)
Chinese Taipei ^a	--	--	--	--	--	--	--
Czech Republic	94 (2.5)	0 (0.0)	32 (4.5)	53 (5.3)	6 (2.3)	50 (4.8)	63 (5.4)
Finland ^b	68 (4.1)	0 (0.0)	2 (1.4)	5 (1.9)	0 (0.0)	8 (2.0)	42 (4.0)
Hungary	94 (1.8)	0 (0.4)	16 (2.6)	14 (2.8)	0 (0.0)	9 (2.3)	76 (3.8)
Indonesia	68 (4.8)	17 (3.4)	15 (3.4)	43 (4.6)	10 (2.6)	26 (4.4)	21 (3.5)
Latvia (LSS)	96 (2.2)	41 (5.7)	91 (3.0)	78 (4.0)	22 (4.7)	88 (2.9)	r 71 (5.1)
Lithuania [†]	93 (2.2)	--	--	--	--	--	--
Macedonia, Rep. of	92 (2.4)	8 (2.6)	68 (4.2)	53 (4.4)	9 (2.5)	49 (4.2)	26 (4.2)
Moldova	70 (2.7)	21 (3.1)	59 (4.2)	--	33 (3.0)	34 (3.8)	30 (3.6)
Morocco ^c	r 80 (3.1)	r 21 (2.7)	r 30 (3.2)	r 76 (2.6)	r 12 (1.9)	r 72 (3.1)	r 64 (3.1)
Netherlands	84 (4.1)	3 (1.3)	7 (3.0)	9 (3.6)	4 (2.2)	3 (2.1)	20 (5.9)
Romania	89 (3.4)	5 (1.9)	8 (2.5)	27 (4.0)	4 (1.9)	40 (4.5)	32 (4.7)
Russian Federation	88 (3.0)	10 (2.3)	53 (3.8)	75 (3.2)	8 (1.9)	77 (3.2)	65 (3.6)
International Avg.	85 (0.9)	13 (0.8)	36 (1.0)	43 (1.2)	10 (0.7)	39 (1.0)	45 (1.2)
Physics							
Belgium (Flemish)	49 (6.0)	66 (5.6)	62 (6.2)	51 (6.1)	50 (5.7)	45 (6.1)	63 (6.2)
Bulgaria	1 (0.9)	74 (6.4)	24 (6.6)	--	27 (4.3)	9 (2.4)	8 (2.5)
Chinese Taipei ^a	8 (2.4)	60 (4.3)	64 (4.2)	32 (4.1)	7 (2.2)	36 (4.0)	9 (2.5)
Czech Republic	1 (1.1)	88 (3.6)	14 (3.5)	46 (5.0)	61 (5.6)	41 (4.3)	35 (5.0)
Finland ^b	0 (0.0)	49 (3.7)	36 (4.2)	6 (1.6)	69 (3.6)	22 (3.3)	16 (1.5)
Hungary	3 (1.5)	92 (2.3)	9 (2.1)	12 (2.7)	80 (3.0)	7 (2.3)	35 (4.4)
Indonesia	21 (4.1)	56 (4.9)	15 (3.4)	52 (5.1)	16 (3.3)	18 (3.5)	15 (3.2)
Latvia (LSS)	6 (2.1)	87 (2.7)	16 (3.1)	50 (4.5)	85 (3.1)	85 (3.1)	r 65 (4.5)
Lithuania [†]	--	90 (2.5)	--	--	--	--	--
Macedonia, Rep. of	9 (2.5)	96 (1.1)	51 (4.1)	54 (4.0)	54 (4.0)	59 (4.5)	25 (3.9)
Moldova	28 (3.0)	71 (2.9)	17 (3.3)	x x	50 (3.7)	50 (4.5)	34 (4.1)
Morocco ^c	11 (2.7)	88 (2.6)	87 (3.0)	82 (3.2)	21 (3.3)	71 (2.9)	47 (3.9)
Netherlands ^d	14 (4.7)	39 (5.4)	28 (6.7)	15 (4.7)	32 (5.7)	13 (4.5)	23 (5.4)
Romania	1 (1.0)	76 (4.0)	43 (4.3)	18 (3.0)	10 (2.6)	37 (3.8)	16 (3.3)
Russian Federation	1 (0.8)	88 (3.0)	5 (2.1)	73 (3.9)	53 (4.1)	74 (4.2)	64 (3.4)
International Avg.	11 (0.8)	75 (1.0)	34 (1.2)	41 (1.2)	44 (1.1)	41 (1.0)	33 (1.1)
Chemistry							
Belgium (Flemish)	--	--	--	--	--	--	--
Bulgaria	30 (4.4)	15 (6.4)	89 (2.7)	--	10 (6.4)	21 (6.3)	13 (2.5)
Chinese Taipei	--	--	--	--	--	--	--
Czech Republic	39 (5.2)	9 (3.0)	91 (3.2)	44 (5.2)	22 (4.2)	40 (5.3)	46 (5.4)
Finland ^b	--	--	--	--	--	--	--
Hungary	27 (3.5)	12 (2.8)	90 (2.2)	18 (3.5)	56 (4.1)	13 (2.9)	32 (3.6)
Indonesia	--	--	--	--	--	--	--
Latvia (LSS)	78 (3.7)	40 (4.9)	93 (2.7)	73 (4.8)	30 (4.4)	87 (3.0)	r 79 (4.4)
Lithuania [†]	--	--	92 (2.5)	--	--	--	--
Macedonia, Rep. of	58 (4.5)	35 (3.8)	96 (1.7)	52 (3.9)	10 (2.6)	52 (4.0)	22 (3.4)
Moldova	62 (3.4)	40 (3.5)	69 (3.6)	--	20 (3.1)	38 (4.1)	29 (3.6)
Morocco	--	--	--	--	--	--	--
Netherlands	--	--	--	--	--	--	--
Romania	7 (2.3)	34 (4.5)	82 (3.1)	23 (3.5)	8 (2.4)	37 (4.4)	16 (3.4)
Russian Federation	62 (5.9)	14 (3.1)	81 (4.3)	69 (5.9)	14 (3.1)	71 (5.3)	63 (3.7)
International Avg.	45 (1.5)	25 (1.5)	87 (1.0)	46 (1.9)	21 (1.4)	45 (1.6)	37 (1.4)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

^a Chinese Taipei: Data for grade 8 physics/chemistry teachers are reported in the physics panel; data for grade 7 biology teachers are not available.

^b Finland: Data for biology and biology/geography teachers are reported in biology panel; data for physics and physics/chemistry teachers are reported in physics panel. Small number of separate chemistry and geography teachers are not reported.

^c Morocco: Data for biology/geology teachers are reported in biology panel; data for physics/chemistry teachers are reported in physics panel.

^d Netherlands: Data for physics/chemistry teachers are reported in physics panel.

Exhibit R3.2 Teachers' Confidence in Their Preparation to Teach Science Topics

	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach Topic ¹					
	Earth science-Earth's features and physical processes	Earth science-the solar system and the universe	Biology-structure and function of human systems	Biology-diversity, structure, and processes of plant and animal life	Chemistry-classification and structure of matter	Chemistry-chemical reactivity and transformation
Australia	38 (3.2)	44 (3.5)	76 (2.8)	68 (3.5)	62 (3.2)	54 (3.6)
Belgium (Flemish)	r 64 (4.5)	r 30 (4.9)	r 79 (2.9)	65 (3.9)	s 58 (5.7)	s 37 (5.9)
Bulgaria	s 44 (3.4)	s 40 (5.7)	s 64 (4.1)	s 60 (4.2)	s 53 (3.8)	s 52 (3.8)
Canada	r 41 (3.4)	r 30 (3.6)	r 59 (3.4)	r 60 (3.0)	s 48 (3.7)	s 36 (3.9)
Chile	13 (2.1)	19 (3.0)	46 (3.5)	44 (3.8)	24 (3.5)	20 (2.9)
Chinese Taipei	17 (3.9)	16 (3.6)	10 (3.6)	12 (4.0)	64 (4.3)	66 (4.4)
Cyprus	r 38 (4.0)	39 (3.2)	56 (2.6)	57 (2.5)	59 (2.9)	56 (2.6)
Czech Republic	70 (3.4)	68 (3.6)	77 (3.1)	74 (3.8)	69 (3.7)	68 (3.5)
England	--	--	--	--	--	--
Finland	55 (3.8)	22 (3.0)	78 (3.5)	64 (3.8)	57 (3.5)	54 (3.5)
Hong Kong, SAR	8 (2.7)	9 (2.6)	44 (4.2)	38 (4.5)	35 (4.8)	36 (4.1)
Hungary	16 (2.3)	17 (2.6)	49 (3.3)	45 (3.1)	40 (2.9)	40 (3.1)
Indonesia	50 (4.4)	56 (4.3)	74 (3.5)	72 (3.5)	40 (5.7)	39 (6.4)
Iran, Islamic Rep.	37 (4.5)	11 (3.2)	66 (4.1)	44 (4.6)	45 (4.5)	44 (4.7)
Israel	r 16 (3.7)	r 15 (3.3)	85 (3.0)	85 (2.7)	79 (3.3)	64 (3.9)
Italy	29 (3.6)	33 (3.8)	67 (3.6)	63 (3.7)	49 (3.6)	36 (4.0)
Japan	12 (2.8)	11 (2.8)	19 (3.5)	16 (3.1)	25 (3.5)	31 (3.6)
Jordan	41 (4.9)	42 (4.8)	72 (4.0)	57 (4.6)	65 (4.1)	59 (4.2)
Korea, Rep. of	26 (3.7)	22 (3.3)	42 (3.6)	34 (3.7)	40 (4.0)	45 (3.6)
Latvia (LSS)	r 14 (2.4)	r 16 (2.9)	62 (3.3)	58 (3.7)	46 (3.6)	60 (3.5)
Lithuania [‡]	--	--	--	--	--	--
Macedonia, Rep. of	r 65 (3.0)	s 65 (2.7)	r 73 (2.5)	r 74 (2.4)	r 74 (2.4)	r 74 (2.4)
Malaysia	16 (4.4)	16 (4.5)	33 (4.3)	34 (4.2)	22 (3.9)	14 (3.7)
Moldova	r 33 (2.8)	r 37 (2.6)	r 49 (3.4)	r 51 (3.1)	r 46 (3.0)	r 49 (2.9)
Morocco	53 (2.9)	32 (3.4)	r 82 (1.9)	r 78 (2.0)	r 66 (3.2)	r 66 (3.1)
Netherlands	r 54 (4.1)	r 43 (4.5)	r 59 (3.8)	r 56 (3.9)	r 41 (4.2)	r 35 (3.9)
New Zealand	44 (4.4)	43 (3.5)	74 (3.6)	70 (3.7)	74 (3.4)	62 (4.2)
Philippines	46 (4.2)	51 (4.4)	36 (4.3)	44 (4.2)	37 (4.5)	15 (3.5)
Romania	r 52 (2.9)	r 49 (3.2)	r 57 (3.6)	r 58 (3.5)	r 65 (2.9)	r 62 (3.0)
Russian Federation	--	--	--	--	--	--
Singapore	13 (3.3)	11 (3.2)	56 (4.6)	52 (4.6)	63 (3.5)	57 (4.1)
South Africa	r 33 (5.9)	r 25 (5.1)	67 (4.1)	60 (3.7)	70 (4.3)	54 (4.6)
Thailand	26 (3.6)	33 (4.0)	45 (4.6)	30 (3.9)	19 (3.6)	15 (3.6)
Tunisia	22 (3.5)	11 (2.6)	81 (3.7)	64 (4.1)	8 (2.7)	8 (3.0)
Turkey	44 (4.1)	50 (3.5)	73 (3.9)	68 (4.2)	83 (2.6)	77 (3.1)
United States	r 61 (3.0)	r 56 (3.4)	r 65 (2.5)	r 62 (3.0)	r 58 (3.4)	r 42 (4.1)
International Avg.	36 (0.6)	32 (0.6)	60 (0.6)	55 (0.6)	51 (0.7)	46 (0.7)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

¹ Does not include students whose teachers report that they do not teach the topic.

² Percentage of students averaged across topics.

[‡] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach Topic ¹				
	Physics-types of energy, sources of energy, conversion between energy types	Physics-light	Environmental and resources issues	Scientific methods and inquiry skills	Average ²
Australia	49 (3.2)	48 (3.3)	49 (3.4)	64 (3.1)	55 (1.8)
Belgium (Flemish)	r 33 (4.1)	r 63 (5.6)	28 (2.6)	30 (3.2)	47 (2.1)
Bulgaria	s 48 (4.9)	s 46 (4.1)	r 28 (2.3)	30 (2.8)	46 (1.9)
Canada	r 48 (3.8)	s 34 (3.4)	r 45 (3.7)	58 (3.0)	44 (1.7)
Chile	19 (3.0)	7 (2.0)	62 (3.3)	32 (3.7)	29 (1.9)
Chinese Taipei	70 (3.8)	58 (4.1)	20 (3.6)	21 (3.6)	42 (2.6)
Cyprus	76 (2.2)	68 (2.1)	59 (2.1)	46 (2.6)	57 (1.4)
Czech Republic	64 (3.2)	r 60 (3.7)	66 (2.8)	12 (2.0)	64 (2.0)
England	--	--	--	--	--
Finland	56 (3.3)	57 (3.3)	31 (2.3)	25 (2.1)	47 (1.7)
Hong Kong, SAR	47 (4.7)	33 (4.5)	30 (4.1)	36 (4.3)	34 (2.4)
Hungary	37 (3.0)	30 (3.3)	21 (2.2)	15 (1.7)	29 (1.4)
Indonesia	68 (3.6)	70 (3.6)	40 (4.0)	35 (4.4)	58 (2.7)
Iran, Islamic Rep.	65 (4.2)	55 (4.9)	43 (4.9)	18 (3.3)	42 (2.8)
Israel	43 (4.1)	r 23 (4.3)	39 (3.6)	55 (4.4)	55 (1.7)
Italy	40 (3.5)	31 (3.5)	48 (4.3)	32 (3.8)	42 (2.1)
Japan	17 (2.9)	11 (3.0)	17 (3.4)	11 (3.0)	17 (1.7)
Jordan	72 (4.0)	69 (4.1)	49 (4.4)	46 (4.7)	57 (2.6)
Korea, Rep. of	35 (3.6)	17 (3.1)	22 (3.3)	21 (3.0)	31 (1.9)
Latvia (LSS)	39 (3.1)	r 41 (3.7)	21 (2.8)	15 (1.9)	37 (1.5)
Lithuania ⁺	--	--	--	--	--
Macedonia, Rep. of	r 70 (2.5)	s 74 (2.5)	r 60 (2.8)	38 (3.6)	72 (1.3)
Malaysia	22 (3.4)	27 (3.8)	25 (3.3)	14 (2.5)	22 (2.3)
Moldova	s 45 (3.5)	s 46 (3.4)	r 30 (2.7)	17 (2.1)	39 (1.6)
Morocco	r 65 (3.4)	r 67 (3.5)	38 (3.1)	35 (3.2)	57 (1.4)
Netherlands	r 54 (3.0)	r 57 (3.5)	49 (3.6)	41 (4.5)	50 (1.7)
New Zealand	62 (3.9)	56 (3.6)	47 (4.0)	61 (4.1)	59 (2.1)
Philippines	52 (4.5)	23 (3.5)	51 (4.2)	52 (4.0)	41 (2.3)
Romania	r 63 (2.9)	r 67 (3.2)	41 (2.7)	26 (2.6)	57 (1.5)
Russian Federation	--	--	--	--	--
Singapore	58 (4.0)	57 (3.9)	30 (4.0)	35 (4.5)	46 (2.4)
South Africa	66 (4.4)	61 (4.6)	34 (3.7)	38 (4.5)	53 (2.8)
Thailand	18 (3.7)	16 (4.7)	35 (4.1)	33 (4.8)	30 (2.4)
Tunisia	6 (2.0)	9 (2.6)	31 (4.0)	18 (3.3)	32 (1.9)
Turkey	75 (3.6)	72 (3.1)	51 (4.6)	32 (3.6)	63 (2.2)
United States	r 55 (4.2)	r 40 (3.6)	r 56 (3.8)	86 (2.2)	58 (1.5)
International Avg.	50 (0.6)	45 (0.6)	39 (0.6)	34 (0.6)	46 (0.4)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.



Percentage of Students Whose Schools Report That Shortages Affect Instructional Capacity Some or A Lot						
Countries with General/Integrated Science		Countries with Separate Science Subjects				
		Earth Science	Biology	Physics	Chemistry	
Australia	5 (2.1)	Belgium (Flemish)	4 (1.5)	7 (3.3)	4 (1.6)	--
Canada	19 (2.1)	Bulgaria	72 (4.3)	70 (4.3)	70 (4.6)	69 (4.5)
Chile	26 (3.5)	Czech Republic	12 (3.8)	9 (3.1)	9 (2.7)	6 (2.6)
Chinese Taipei ^a	21 (3.4)	Finland	5 (1.6)	7 (2.0)	3 (1.1)	4 (1.3)
Cyprus	15 (0.2)	Hungary	10 (2.4)	9 (2.3)	15 (2.8)	11 (2.3)
England ^r	5 (2.1)	Latvia (LSS)	--	31 (4.8)	39 (4.4)	30 (4.4)
Hong Kong, SAR	13 (2.7)	Lithuania [‡]	--	4 (1.7)	7 (2.1)	7 (1.9)
Indonesia ^b	39 (5.0)	Macedonia, Rep. of	13 (2.7)	14 (2.6)	12 (2.6)	13 (2.5)
Iran, Islamic Rep.	43 (4.0)	Moldova	66 (3.6)	65 (3.6)	72 (3.5)	69 (3.5)
Israel	42 (4.7)	Morocco ^c	--	45 (4.6)	45 (4.6)	--
Italy	26 (3.6)	Netherlands ^r	5 (1.6)	12 (5.8)	24 (6.5)	22 (6.6)
Japan	17 (3.3)	Romania	19 (3.3)	11 (2.6)	9 (2.4)	12 (2.7)
Jordan	88 (2.7)	Russian Federation	42 (3.5)	40 (3.6)	39 (3.7)	40 (4.0)
Korea, Rep. of	32 (3.9)	Slovak Republic	24 (4.1)	8 (2.9)	13 (2.9)	11 (3.2)
Malaysia	51 (3.9)	Slovenia	--	54 (4.4)	55 (4.2)	56 (4.3)
New Zealand	13 (3.0)	International Avg.	25 (0.9)	26 (0.9)	28 (0.9)	27 (1.0)
Philippines	41 (4.2)					
Singapore	17 (3.2)					
South Africa	45 (3.4)					
Thailand	70 (4.1)					
Tunisia	85 (3.0)					
Turkey	81 (2.8)					
United States ^r	16 (2.5)					
International Avg.	35 (0.7)					

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by schools.

* Countries are classified as having either general/integrated science or separate subject area classes at grade 8.

‡ Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

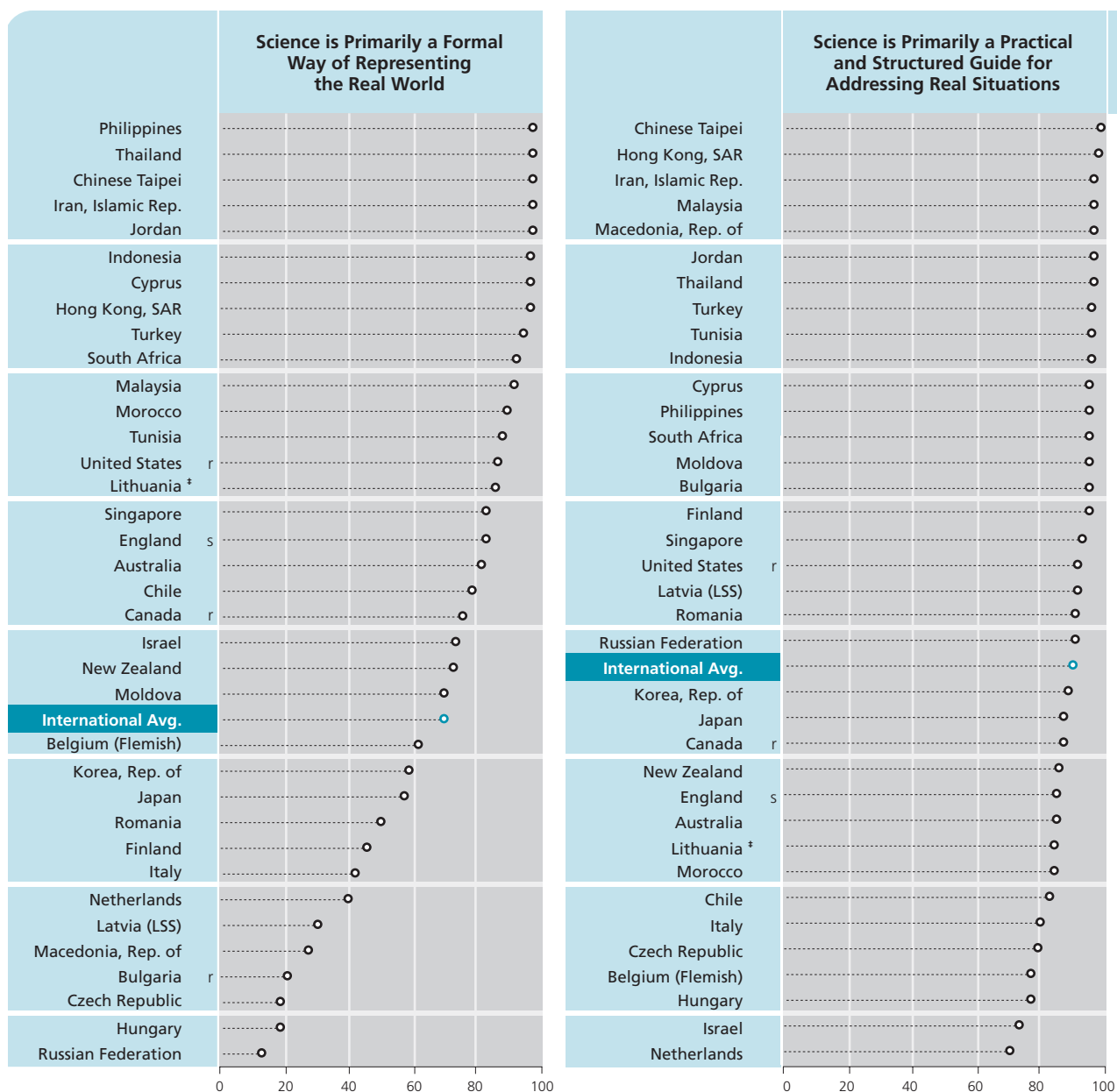
^a Chinese Taipei: Data pertain to teachers of grade 8 physics/chemistry course.^b Indonesia: Data pertain to teachers of 'IPA science', a composite course taught by biology and physics teachers.^c Morocco: Data pertaining to teachers of Natural Science course (biology/geology) are reported in biology column; data pertaining to teachers of physics/chemistry course are reported in physics column.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "r" indicates school response data available for 70-84% of students.

Exhibit R3.4 Percentage of Students Whose Science Teachers Agree or Strongly Agree with Statements About the Nature of Science and Science Teaching



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

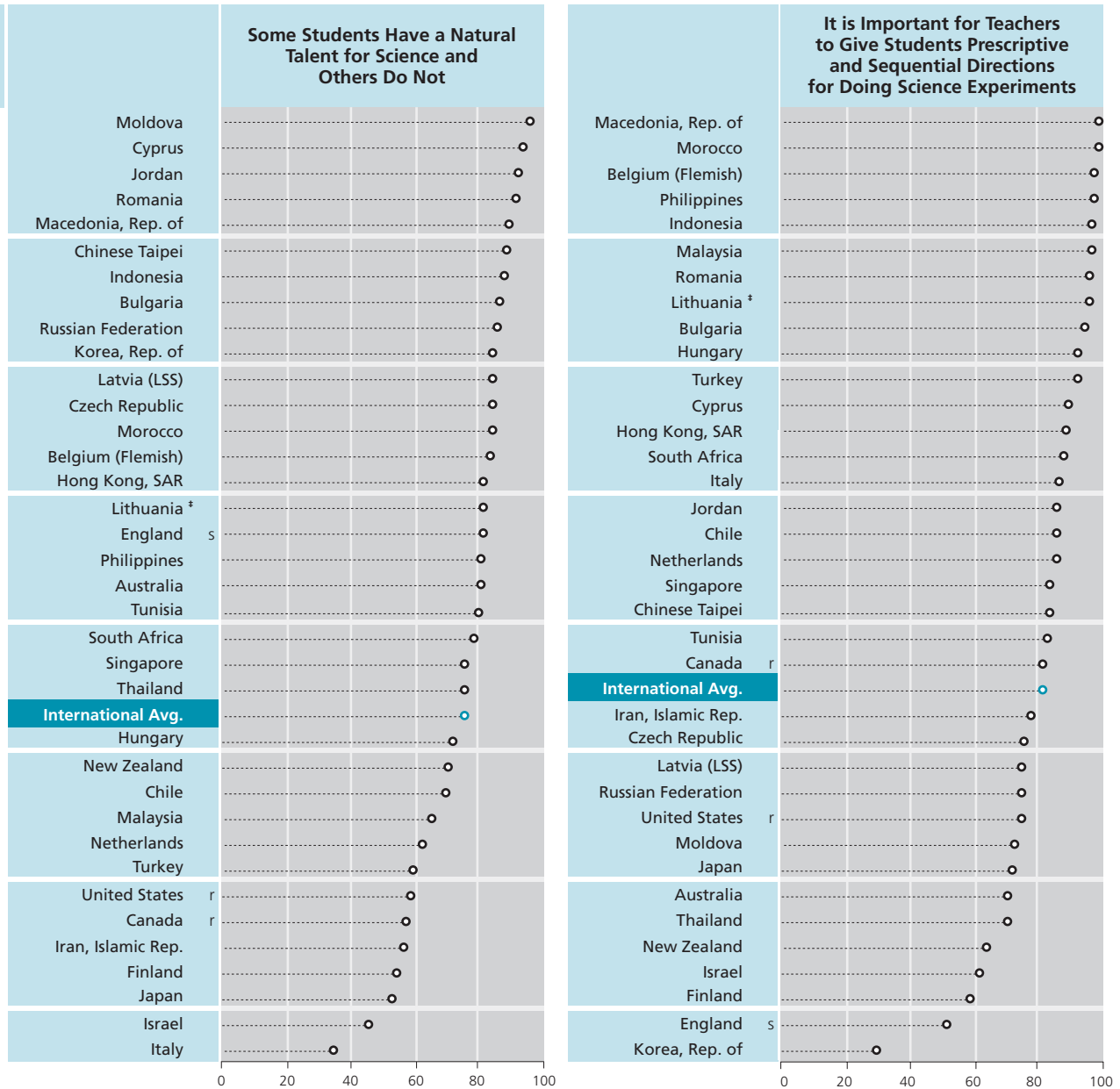
Background data provided by teachers.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

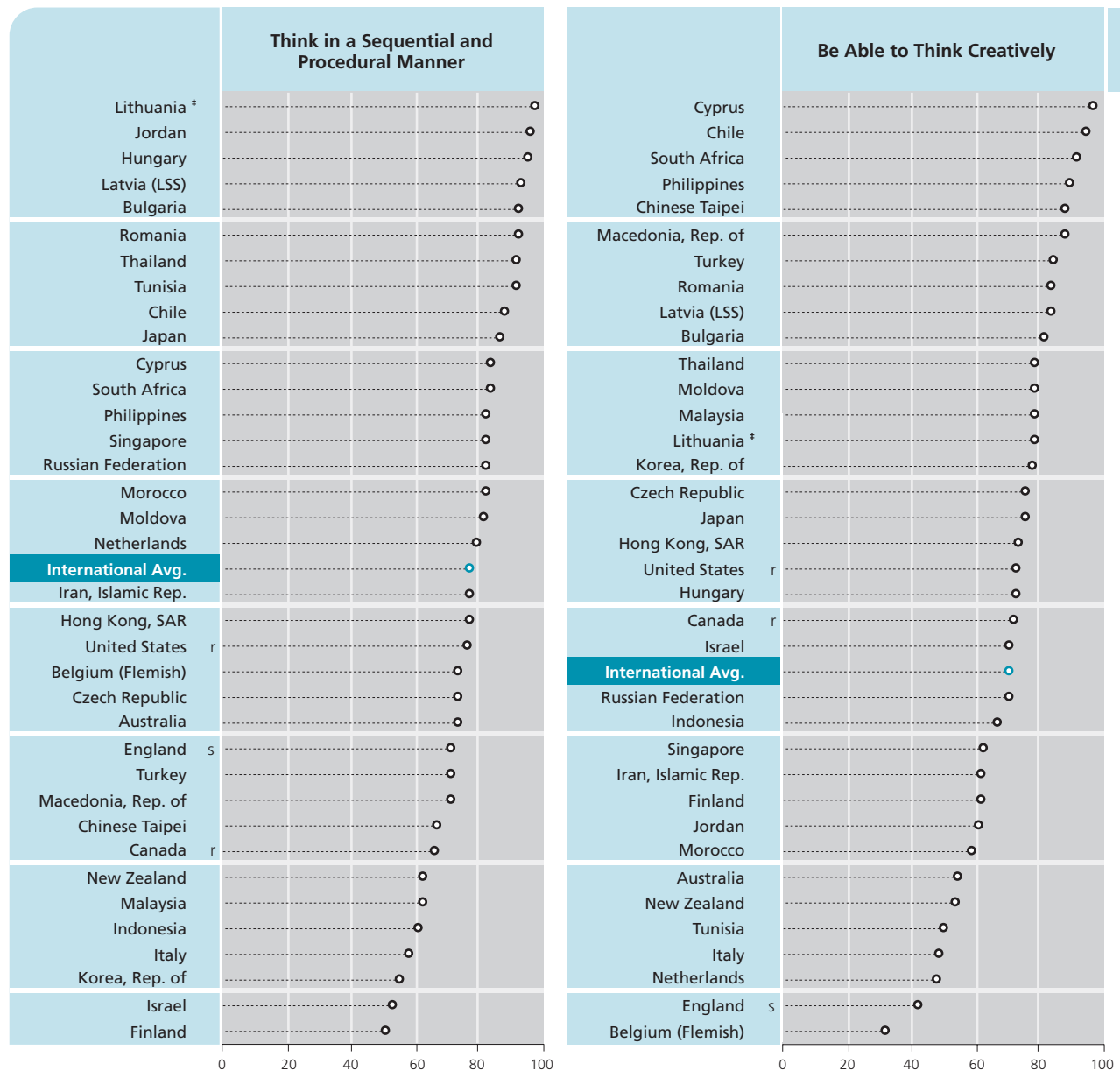
An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

Exhibit R3.4: Percentage of Students Whose Science Teachers Agree or Strongly Agree with Statements About the Nature of Science and Science Teaching (Continued)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Exhibit R3.5 Percentage of Students Whose Science Teachers Think Particular Abilities Are Very Important for Students' Success in Science in School



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

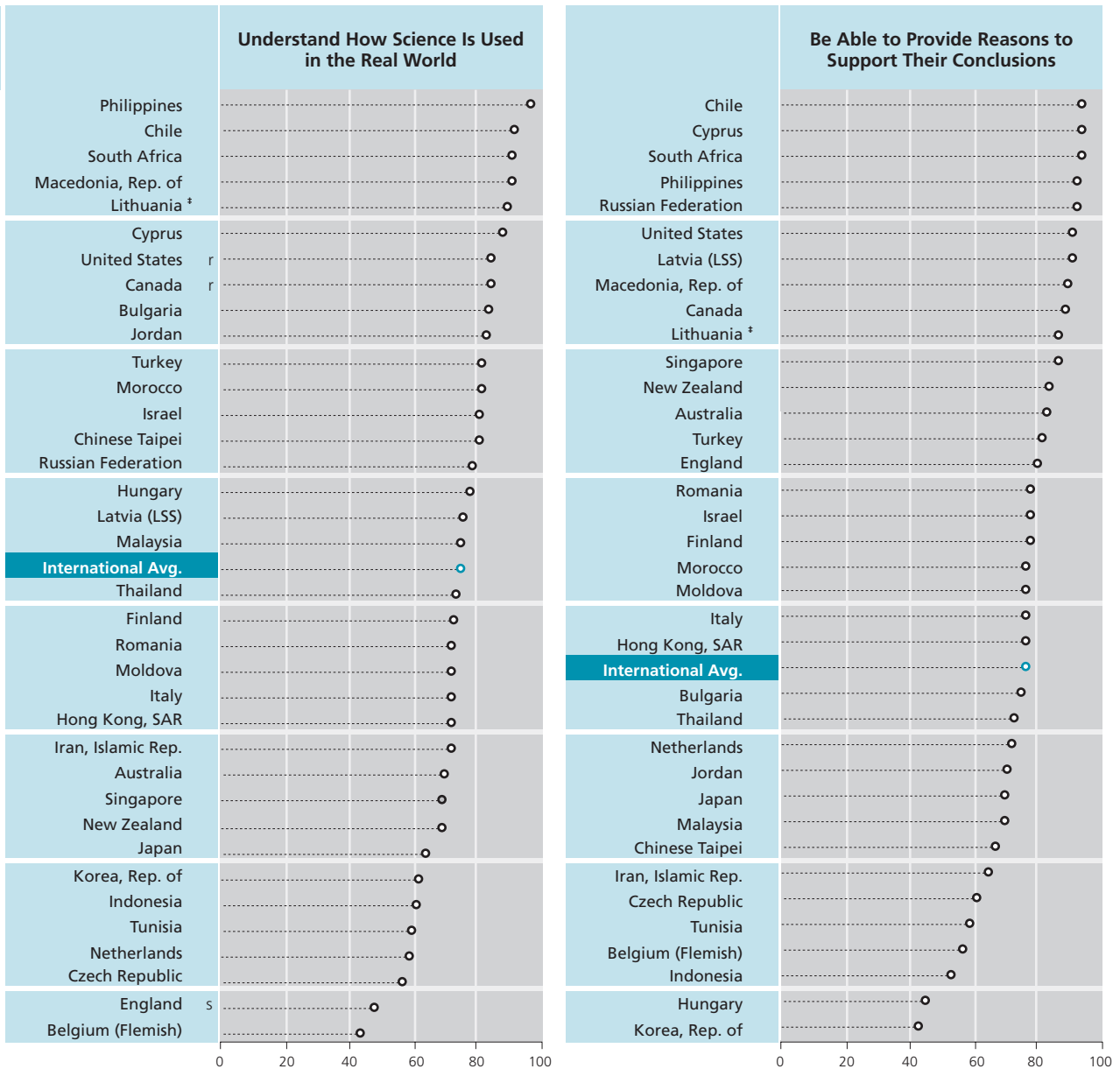
Background data provided by teachers.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

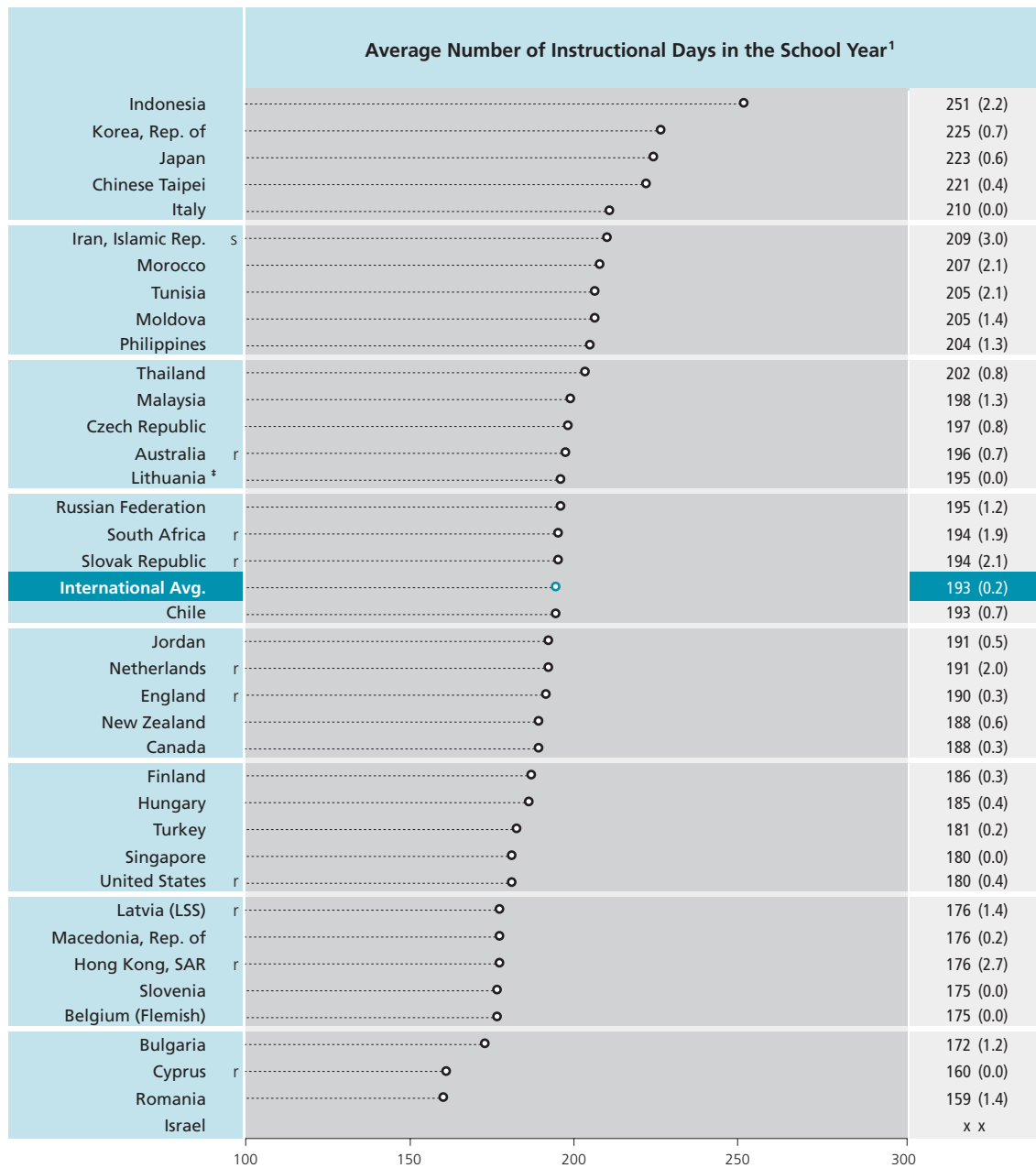
An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

Exhibit R3.5: Percentage of Students Whose Science Teachers Think Particular Abilities Are Very Important for Students' Success in Science in School (Continued)



SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Exhibit R3.6 Average Number of Instructional Days in the School Year



Background data provided by schools.

¹ Days reported averaged across students.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates school response data available for 70-84% of students. An "s" indicates school response data available for 50-69% of students. An "x" indicates school response data available for <50% of students.

Exhibit R3.7 Instructional Time in School



	Yearly Amount of Instructional Time in Hours Averaged Across Students		Yearly Amount of Total Time in School in Hours Averaged Across Students	Percent of Total Hours Spent on Instruction ¹
Philippines	o	s 1481 (28.9)	s 1551 (57.7)	x x
Chinese Taipei	o	1374 (13.7)	1742 (15.0)	79 (0.8)
Indonesia	o	r 1355 (35.2)	r 1586 (49.4)	r 86 (1.0)
Thailand	o	r 1280 (16.9)	r 1524 (18.1)	r 84 (0.8)
Italy	o	1124 (7.4)	1228 (9.2)	92 (0.5)
Morocco	o	s 1113 (24.4)	s 1178 (38.6)	s 96 (1.0)
Chile	o	s 1110 (20.4)	s 1277 (25.1)	s 88 (0.9)
Korea, Rep. of	o	1067 (17.7)	1442 (27.9)	76 (1.2)
United States	o	s 1061 (15.8)	s 1303 (23.1)	x x
Japan	o	1057 (11.5)	1593 (27.5)	69 (1.3)
Malaysia	o	1057 (11.0)	1140 (9.7)	93 (0.5)
Bulgaria	o	s 1049 (18.3)	s 1202 (22.3)	s 88 (1.0)
Australia	o	r 1021 (9.2)	s 1313 (15.6)	s 78 (0.8)
Netherlands	o	s 1018 (15.3)	s 1269 (29.0)	s 81 (1.2)
Moldova	o	s 1012 (22.2)	s 1310 (24.5)	s 77 (1.4)
Jordan	o	r 1003 (20.7)	1196 (16.5)	r 84 (1.0)
Romania	o	r 1002 (10.4)	r 1165 (29.7)	r 88 (1.7)
Hong Kong, SAR	o	s 988 (26.7)	s 1385 (44.2)	s 71 (1.0)
Belgium (Flemish)	o	980 (0.0)	1120 (0.0)	87 (0.0)
Canada	o	979 (6.1)	1358 (13.6)	73 (0.7)
Slovak Republic	o	s 969 (18.8)	s 1203 (25.1)	x x
Finland	o	969 (11.7)	1133 (5.7)	86 (0.9)
Tunisia	o	r 961 (19.7)	r 1177 (34.3)	s 85 (1.5)
New Zealand	o	958 (6.8)	r 1315 (12.3)	r 74 (0.7)
Hungary	o	956 (14.3)	1301 (22.8)	75 (1.4)
England	o	r 953 (4.8)	r 1271 (10.0)	r 76 (0.6)
Czech Republic	o	948 (10.4)	1249 (16.9)	77 (1.0)
Latvia (LSS)	o	s 905 (23.2)	s 1212 (24.1)	s 77 (1.4)
Lithuania [‡]	o	897 (0.0)	--	--
Singapore	o	880 (11.2)	1213 (21.1)	73 (1.4)
Russian Federation	o	s 870 (17.0)	s 1153 (18.5)	s 75 (1.1)
Cyprus	o	r 832 (0.0)	r 960 (0.0)	r 87 (0.0)
Slovenia	o	770 (0.0)	875 (0.0)	88 (0.0)
Macedonia, Rep. of	o	s 745 (17.7)	s 974 (22.6)	x x
Iran, Islamic Rep.		x x	x x	x x
Israel		x x	x x	x x
South Africa		x x	s 1285 (31.8)	x x
Turkey		x x	x x	x x
International Avg.	o	1022 (2.9)	1271 (4.4)	81 (0.2)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by schools.

¹ Computed as the ratio of instructional hours to total hours averaged across students.

[‡] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "r" indicates school response data available for 70-84% of students. An "s" indicates school response data available for 50-69% of students. An "x" indicates school response data available for <50% of students.

	Percentage of Formally Scheduled School Time Averaged Across Students				
	Teaching Science, Mathematics, and Other Subjects	Teaching Science ¹	Curriculum Planning ²	Administrative Duties	Other Activities ³
Australia	80 (0.7)	r 63 (1.9)	r 5 (0.7)	r 5 (0.6)	11 (0.7)
Belgium (Flemish)	86 (1.1)	r 64 (2.2)	3 (0.4)	1 (0.3)	10 (0.7)
Bulgaria	r 71 (1.4)	r 60 (1.9)	r 9 (0.8)	r 5 (0.5)	r 16 (0.9)
Canada	79 (1.0)	41 (1.6)	8 (0.5)	1 (0.3)	12 (0.7)
Chile	72 (1.3)	45 (1.7)	9 (0.6)	5 (0.7)	14 (1.0)
Chinese Taipei	59 (2.3)	58 (2.4)	10 (1.0)	5 (1.0)	26 (1.7)
Cyprus	r 83 (1.3)	r 83 (1.3)	r 5 (0.5)	r 3 (0.6)	r 10 (0.8)
Czech Republic	68 (1.6)	41 (1.2)	13 (1.1)	3 (0.3)	16 (0.6)
England	s 89 (1.0)	s 84 (1.1)	s 1 (0.4)	s 3 (0.6)	s 8 (0.8)
Finland	85 (0.7)	60 (1.2)	2 (0.3)	1 (0.2)	12 (0.5)
Hong Kong, SAR	x x	x x	x x	x x	x x
Hungary	62 (0.9)	39 (0.9)	11 (0.5)	7 (0.3)	20 (0.7)
Indonesia	66 (1.8)	64 (1.9)	12 (0.9)	7 (0.6)	15 (0.9)
Iran, Islamic Rep.	62 (3.4)	60 (3.4)	11 (1.2)	2 (0.5)	25 (3.2)
Israel	r 78 (1.7)	r 75 (1.8)	r 10 (1.2)	s 2 (0.3)	r 10 (1.1)
Italy	87 (1.1)	31 (0.7)	7 (0.8)	0 (0.1)	6 (0.6)
Japan	65 (1.9)	58 (2.0)	9 (1.0)	4 (0.4)	22 (1.3)
Jordan	67 (1.2)	52 (1.9)	11 (0.5)	4 (0.3)	18 (0.8)
Korea, Rep. of	48 (1.3)	47 (1.3)	15 (0.6)	13 (0.6)	24 (1.0)
Latvia (LSS)	r 70 (1.6)	r 55 (1.7)	r 4 (0.4)	r 4 (1.1)	r 23 (1.2)
Lithuania †	65 (1.0)	59 (1.1)	11 (0.5)	5 (0.8)	20 (0.7)
Macedonia, Rep. of	52 (0.8)	47 (0.9)	21 (0.7)	5 (0.2)	22 (0.6)
Malaysia	65 (1.0)	54 (1.4)	10 (0.5)	6 (0.4)	19 (0.7)
Moldova	60 (1.2)	r 53 (1.2)	r 13 (0.9)	r 5 (0.7)	22 (0.8)
Morocco	76 (1.7)	74 (1.8)	10 (0.9)	1 (0.3)	13 (0.9)
Netherlands ⁴	r 87 (0.7)	r 75 (2.1)	--	--	r 13 (0.7)
New Zealand	83 (1.0)	71 (1.7)	2 (0.4)	5 (0.7)	10 (0.7)
Philippines	71 (1.7)	57 (2.2)	8 (0.9)	3 (0.4)	18 (1.3)
Romania	55 (1.4)	47 (1.3)	12 (0.7)	6 (0.5)	28 (1.0)
Russian Federation ⁵	--	--	--	--	--
Singapore	75 (0.9)	65 (1.2)	--	3 (0.4)	22 (0.8)
South Africa	77 (1.5)	r 58 (2.5)	r 6 (0.8)	r 5 (0.8)	13 (0.9)
Thailand	59 (1.4)	51 (1.6)	17 (0.9)	3 (0.4)	21 (1.1)
Tunisia	60 (1.4)	60 (1.5)	22 (1.1)	2 (0.6)	15 (1.1)
Turkey	63 (1.3)	51 (1.3)	14 (0.9)	4 (0.8)	19 (1.0)
United States	r 74 (1.0)	r 62 (1.7)	r 13 (0.7)	r 2 (0.3)	r 12 (0.9)
International Avg.	71 (0.2)	58 (0.3)	10 (0.1)	4 (0.1)	17 (0.2)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

¹ Reflects total hours reported teaching General/Integrated Science, Physical Science, Earth Science, Life Science, Biology, Chemistry and Physics.

² Includes individual curriculum planning and cooperative curriculum planning.

³ Includes student supervision (other than teaching), student counseling/appraisal, other non-student contact time, and other activities.

⁴ Netherlands: Data in other activities category reflects the total reported for curriculum planning, administrative duties and other activities.

⁵ Russian Federation: Formally scheduled school time is for instruction only; teachers are not formally scheduled for other activities.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students. An "x" indicates teacher response data available for <50% of students.



Exhibit R3.9 Overleaf

	Percentage of Students Whose Teachers Report Most or Every Lesson				
	Explain Reasoning Behind an Idea	Represent and Analyze Relationships Using Tables, Charts, or Graphs	Work on Problems for Which There Is No Immediately Obvious Method of Solution	Write Explanations About What Was Observed and Why It Happened	Put Events or Objects in Order and Give a Reason for the Organization
Australia	65 (3.1)	22 (2.8)	9 (1.8)	68 (3.5)	26 (3.0)
Belgium (Flemish)	53 (3.4)	37 (2.6)	r 6 (1.5)	12 (2.0)	9 (1.7)
Bulgaria	r 81 (2.5)	r 55 (2.3)	r 9 (1.6)	r 14 (1.9)	r 61 (2.2)
Canada	r 85 (2.5)	r 35 (3.3)	r 17 (3.1)	r 78 (2.4)	r 36 (3.7)
Chile	67 (3.2)	33 (3.7)	18 (2.9)	68 (3.4)	45 (3.6)
Chinese Taipei	42 (3.6)	35 (3.7)	14 (2.9)	57 (4.4)	34 (3.7)
Cyprus	s 88 (2.5)	s 40 (4.2)	s 4 (1.9)	s 57 (4.1)	s 53 (4.9)
Czech Republic	89 (2.0)	17 (1.9)	10 (1.9)	32 (2.9)	32 (2.8)
England	s 64 (4.8)	s 24 (3.7)	s 3 (1.2)	s 67 (4.6)	s 21 (3.7)
Finland	59 (3.0)	30 (2.3)	20 (2.5)	42 (2.4)	40 (2.8)
Hong Kong, SAR	50 (4.6)	22 (4.0)	10 (2.6)	34 (4.2)	23 (3.5)
Hungary	81 (1.7)	49 (1.9)	16 (1.8)	30 (2.2)	46 (2.3)
Indonesia	47 (4.0)	39 (3.8)	39 (3.4)	52 (3.4)	64 (3.5)
Iran, Islamic Rep.	49 (4.3)	15 (2.9)	22 (3.2)	55 (4.0)	41 (4.4)
Israel	71 (3.7)	28 (3.8)	r 9 (2.0)	71 (3.3)	47 (3.6)
Italy	88 (2.4)	44 (3.6)	25 (3.4)	46 (4.1)	43 (4.1)
Japan	69 (4.1)	60 (4.0)	32 (4.0)	57 (4.0)	48 (4.2)
Jordan	73 (3.7)	28 (4.1)	7 (2.3)	61 (4.1)	67 (3.6)
Korea, Rep. of	58 (4.0)	47 (4.0)	16 (2.9)	50 (3.6)	17 (3.0)
Latvia (LSS)	r 60 (2.6)	r 46 (3.0)	r 12 (1.8)	r 13 (1.7)	r 31 (2.8)
Lithuania [†]	61 (2.5)	40 (2.6)	13 (1.6)	73 (2.2)	33 (2.3)
Macedonia, Rep. of	73 (2.1)	58 (2.8)	14 (2.0)	48 (2.4)	35 (2.5)
Malaysia	68 (3.8)	32 (3.6)	25 (3.5)	71 (4.2)	56 (4.5)
Moldova	87 (1.5)	22 (2.1)	15 (1.9)	32 (2.4)	48 (2.5)
Morocco	47 (3.1)	31 (2.8)	6 (1.1)	78 (1.8)	59 (3.0)
Netherlands	57 (3.7)	15 (2.5)	18 (2.8)	34 (4.7)	20 (2.5)
New Zealand	63 (3.9)	12 (2.3)	5 (1.9)	71 (3.6)	20 (3.1)
Philippines	81 (3.5)	40 (3.8)	16 (3.2)	77 (3.3)	61 (4.0)
Romania	91 (1.6)	40 (2.3)	11 (1.5)	52 (2.5)	40 (2.4)
Russian Federation	55 (2.2)	35 (1.8)	10 (1.6)	36 (1.9)	71 (2.2)
Singapore	63 (4.3)	13 (2.8)	8 (1.9)	44 (4.7)	30 (4.1)
South Africa	62 (4.2)	35 (4.0)	22 (3.9)	53 (3.9)	40 (4.5)
Thailand	61 (4.1)	18 (3.2)	28 (3.7)	38 (4.3)	47 (4.5)
Tunisia	79 (3.6)	62 (4.5)	8 (2.2)	89 (2.8)	55 (4.2)
Turkey	70 (3.6)	60 (3.7)	17 (3.1)	56 (4.4)	61 (3.8)
United States	r 80 (3.2)	r 40 (3.1)	r 18 (2.3)	r 59 (3.3)	r 40 (3.3)
International Avg.	68 (0.6)	35 (0.5)	15 (0.4)	52 (0.6)	42 (0.6)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

[†] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

	Explain Reasoning Behind an Idea		Represent and Analyze Relationships Using Tables, Charts, or Graphs		Work on Problems for Which There Is No Immediately Obvious Method of Solution		Write Explanations About What Was Observed and Why It Happened		Put Events or Objects in Order and Give a Reason for the Organization	
	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference
Australia	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
Belgium (Flemish)	53 (3.4) r	5 (5.9) ●	37 (2.6) r	3 (5.5) ●	6 (1.5) r	0 (2.6) ●	12 (2.0) r	-4 (4.3) ●	9 (1.7) r	-3 (3.4) ●
Canada	85 (2.5) r	7 (4.7) ●	35 (3.3) r	11 (5.6) ●	17 (3.1) r	12 (4.7) ●	78 (2.4) r	24 (6.5) ▲	36 (3.7) r	19 (4.9) ▲
Cyprus	88 (2.5) s	14 (5.9) ●	40 (4.2) s	4 (7.0) ●	4 (1.9) s	-3 (3.8) ●	57 (4.1) s	10 (7.7) ●	53 (4.9) s	-8 (7.9) ●
Czech Republic	89 (2.0)	-3 (2.5) ●	17 (1.9)	0 (3.0) ●	10 (1.9)	3 (2.5) ●	32 (2.9)	-15 (4.7) ▼	32 (2.8) r	5 (4.0) ●
England	64 (4.8) s	-8 (5.6) ●	24 (3.7) s	-2 (4.5) ●	x x	x x	67 (4.6) s	-5 (5.5) ●	21 (3.7) s	-1 (4.7) ●
Hong Kong, SAR	50 (4.6)	10 (7.9) ●	22 (4.0)	3 (6.1) ●	10 (2.6)	7 (3.4) ●	34 (4.2)	-23 (7.5) ▼	23 (3.5)	-5 (6.3) ●
Hungary	81 (1.7)	3 (2.8) ●	49 (1.9)	3 (3.4) ●	16 (1.8)	3 (2.6) ●	30 (2.2)	-9 (3.2) ●	46 (2.3)	-4 (2.9) ●
Iran, Islamic Rep.	49 (4.3)	-1 (7.6) ●	15 (2.9)	4 (4.0) ●	22 (3.2)	-3 (7.3) ●	55 (4.0)	29 (7.6) ▲	41 (4.4)	20 (7.8) ●
Israel †	71 (4.0) r	-14 (6.7) ●	26 (4.1) r	9 (7.3) ●	8 (2.1) s	4 (4.0) ●	71 (3.8) r	5 (10.5) ●	40 (4.3) s	2 (9.0) ●
Italy	87 (3.0)	11 (5.2) ●	42 (4.0)	15 (5.6) ●	23 (3.8)	8 (5.2) ●	43 (4.8)	13 (6.5) ●	43 (5.2)	-2 (6.9) ●
Japan	69 (4.1)	12 (6.3) ●	60 (4.0)	13 (5.8) ●	32 (4.0)	20 (4.9) ▲	57 (4.0)	-3 (5.9) ●	48 (4.2)	8 (6.1) ●
Korea, Rep. of	58 (4.0)	-5 (5.5) ●	47 (4.0)	-7 (5.9) ●	16 (2.9)	-7 (4.5) ●	50 (3.6)	0 (5.1) ●	17 (3.0)	-17 (4.8) ▼
Latvia (LSS)	60 (2.6) s	4 (3.7) ●	46 (3.0) s	-3 (4.1) ●	12 (1.8) s	-3 (2.6) ●	13 (1.7) s	-40 (3.5) ▼	31 (2.8) s	-4 (3.9) ●
Lithuania	61 (2.5) r	4 (3.2) ●	40 (2.6) r	9 (3.4) ●	13 (1.6) r	8 (1.9) ▲	73 (2.2) r	47 (3.1) ▲	33 (2.3) r	-12 (3.5) ▼
Netherlands	57 (3.7) r	-1 (6.2) ●	15 (2.5) r	3 (3.3) ●	18 (2.8) r	7 (3.6) ●	34 (4.7) r	6 (5.6) ●	20 (2.5) r	8 (3.3) ●
New Zealand	63 (3.9)	7 (5.7) ●	12 (2.3)	1 (3.5) ●	5 (1.9)	2 (2.4) ●	71 (3.6)	2 (5.3) ●	20 (3.1)	9 (4.1) ●
Romania	91 (1.6)	1 (2.1) ●	40 (2.3)	1 (3.3) ●	11 (1.5) r	-4 (2.4) ●	52 (2.5)	7 (3.3) ●	40 (2.4)	19 (3.1) ▲
Russian Federation	55 (2.2)	-5 (3.8) ●	35 (1.8)	7 (3.6) ●	10 (1.6)	2 (2.1) ●	36 (1.9)	19 (2.9) ▲	71 (2.2)	11 (4.8) ●
Singapore	63 (4.3)	13 (6.8) ●	13 (2.8)	4 (4.0) ●	8 (1.9)	5 (2.7) ●	44 (4.7)	-6 (6.6) ●	30 (4.1)	5 (5.9) ●
Thailand †	61 (4.1) r	-1 (7.5) ●	18 (3.2) r	-4 (6.3) ●	28 (3.7) s	10 (5.4) ●	38 (4.3) s	-12 (7.5) ●	47 (4.5) r	-5 (7.4) ●
United States	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
International Avg. §	68 (0.7)	4 (1.2) ▲	33 (0.7)	4 (1.1) ▲	13 (0.5)	3 (0.9) ▲	48 (0.8)	5 (1.3) ▲	34 (0.8)	2 (1.2) ●

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

▲ 1999 significantly higher than 1995

● No significant difference between 1995 and 1999

▼ 1999 significantly lower than 1995

Significance tests adjusted for multiple comparisons

Background data provided by teachers.

† Countries with unapproved sampling procedures at the classroom level in 1995.

§ International average is for countries that participated and met sampling guidelines in both 1995 and 1999.

Trend notes: Because coverage fell below 65% in 1995 and 1999, Latvia is annotated LSS for Latvian-Speaking Schools only. Lithuania tested later in 1999 than in 1995, at the beginning of the next school year. In 1995, Italy and Israel were unable to cover their International Desired Population; 1999 data are based on their comparable populations.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

Background data for Bulgaria and South Africa are unavailable for 1995.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates teacher response data available for 70-84% of students, based on the lower response rate in either 1995 or 1999. An "s" indicates teacher response data available for 50-69% of students, based on the lower response rate in either 1995 or 1999. An "x" indicates teacher response data available for <50% of students, based on the lower response rate in either 1995 or 1999.

Percentage of Students Reporting Almost Always or Pretty Often						
Countries with General/ Integrated Science		Countries with Separate Science Subjects				
		Earth Science	Biology	Physics	Chemistry	
Australia	79 (1.1)	Belgium (Flemish)	13 (1.0)	71 (1.5)	81 (2.3)	--
Canada	77 (1.2)	Bulgaria	22 (1.4)	34 (1.8)	48 (1.5)	57 (2.2)
Chile	58 (1.4)	Czech Republic	6 (0.8)	24 (1.8)	53 (2.3)	76 (1.9)
Chinese Taipei ^a	70 (1.3)	Finland	23 (1.1)	27 (1.2)	57 (1.6)	61 (1.4)
Cyprus	92 (0.6)	Hungary	12 (0.8)	26 (1.3)	70 (1.7)	82 (1.7)
England	91 (0.9)	Latvia (LSS)	--	29 (1.8)	49 (2.0)	61 (2.1)
Hong Kong, SAR	88 (0.9)	Lithuania [†]	--	--	--	--
Indonesia ^b	34 (1.4)	Macedonia, Rep. of	30 (1.2)	59 (1.4)	66 (1.5)	73 (1.5)
Iran, Islamic Rep.	59 (1.9)	Moldova	39 (1.7)	57 (1.6)	68 (1.5)	72 (1.4)
Israel	79 (1.5)	Morocco	x x	^s 78 (1.2)	x x	x x
Italy	29 (1.6)	Netherlands ^c	7 (0.9)	32 (2.8)	56 (2.7)	--
Japan	75 (1.5)	Romania	27 (1.5)	47 (1.5)	59 (1.7)	65 (1.8)
Jordan	70 (1.4)	Russian Federation	17 (1.1)	37 (1.7)	69 (1.7)	75 (1.6)
Korea, Rep. of	53 (1.7)	Slovak Republic	13 (0.8)	31 (1.8)	54 (1.9)	58 (2.0)
Malaysia	78 (1.7)	Slovenia	--	41 (1.5)	57 (1.6)	73 (1.3)
New Zealand	84 (0.9)	International Avg.	19 (0.3)	42 (0.4)	61 (0.5)	68 (0.5)
Philippines	77 (0.9)					
Singapore	88 (1.0)					
South Africa	69 (1.6)					
Thailand	80 (1.2)					
Tunisia	84 (0.6)					
Turkey	54 (1.7)					
United States	71 (1.1)					
International Avg.	71 (0.3)					

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by students.

* Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.

[†] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.

^b Indonesia: Students were asked about 'IPA science'; data pertain to the composite course taught by biology and physics teachers.

^c Netherlands: Data in physics panel pertain to physics/chemistry course.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "s" indicates a 50-69% student response rate. An "x" indicates a <50% student response rate.

Percentage of Students Reporting Almost Always or Pretty Often

Countries with General/Integrated Science		Countries with Separate Science Subjects								
	Percent of Students 1999	1995-1999 Difference	Earth Science		Biology		Physics		Chemistry	
			Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference
Australia	79 (1.1)	3 (1.5)	13 (1.0)	-5 (1.8)	71 (1.5)	-8 (2.3)	81 (2.3)	-4 (3.5)	--	--
Canada	77 (1.2)	4 (1.8)	6 (0.8)	2 (0.9)	24 (1.8)	4 (2.7)	53 (2.3)	-6 (3.3)	76 (1.9)	6 (3.1)
Cyprus	92 (0.6)	3 (0.9)	12 (0.8)	3 (1.1)	26 (1.3)	8 (2.0)	70 (1.7)	2 (2.3)	82 (1.7)	1 (2.4)
England	91 (0.9)	1 (1.3)	--	--	29 (1.8)	-19 (2.6)	49 (2.0)	-24 (2.6)	61 (2.1)	-17 (2.7)
Hong Kong, SAR	88 (0.9)	-3 (1.3)	--	--	--	--	--	--	--	--
Iran, Islamic Rep.	59 (1.9)	-5 (3.0)	7 (0.9)	1 (1.1)	32 (2.8)	4 (3.5)	56 (2.7)	2 (3.6)	--	--
Israel [†]	81 (1.7)	8 (3.2)	27 (1.5)	-8 (2.1)	47 (1.5)	-2 (2.0)	59 (1.7)	-1 (2.4)	65 (1.8)	2 (2.5)
Italy	29 (1.8)	-9 (2.8)	17 (1.1)	1 (1.8)	37 (1.7)	7 (2.3)	69 (1.7)	-1 (2.3)	75 (1.6)	5 (2.5)
Japan	75 (1.5)	9 (2.2)	13 (0.8)	1 (1.1)	31 (1.8)	2 (2.3)	54 (1.9)	-4 (2.7)	58 (2.0)	-6 (2.6)
Korea, Rep. of	53 (1.7)	11 (2.4)	--	--	41 (1.5)	5 (2.5)	57 (1.6)	-4 (2.4)	73 (1.3)	1 (2.2)
New Zealand	84 (0.9)	6 (1.5)	13 (0.4)	0 (0.5)	38 (0.6)	1 (0.8)	61 (0.7)	-4 (0.9)	70 (0.7)	1 (0.9)
Singapore	88 (1.0)	1 (1.4)	--	--	--	--	--	--	--	--
Thailand [†]	80 (1.2)	-4 (1.7)	--	--	--	--	--	--	--	--
United States	71 (1.1)	2 (1.7)	--	--	--	--	--	--	--	--
International Avg.[§]	74 (0.4)	2 (0.6)	13 (0.4)	0 (0.5)	38 (0.6)	1 (0.8)	61 (0.7)	-4 (0.9)	70 (0.7)	1 (0.9)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

▲ 1999 significantly higher than 1995
 ● No significant difference between 1995 and 1999
 ▼ 1999 significantly lower than 1995

Significance tests adjusted for multiple comparisons

Background data provided by students.

* Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.

† Countries with unapproved sampling procedures at the classroom level in 1995.

§ International average is for countries that participated and met sampling guidelines in both 1995 and 1999.

c Netherlands: Data in physics panel pertain to physics/chemistry course.

Trend notes: Because coverage fell below 65% in 1995 and 1999, Latvia is annotated L55 for Latvian-Speaking Schools only. Lithuania tested later in 1999 than in 1995, at the beginning of the next school year. In 1995, Italy and Israel were unable to cover their International Desired Population; 1999 data are based on their comparable populations.

Background data for Bulgaria and South Africa are unavailable for 1995.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

Percentage of Students Reporting Almost Always or Pretty Often						
Countries with General/ Integrated Science		Countries with Separate Science Subjects				
		Earth Science	Biology	Physics	Chemistry	
Australia	81 (1.3)	Belgium (Flemish)	8 (0.7)	36 (1.6)	61 (3.1)	--
Canada	69 (1.4)	Bulgaria	18 (1.3)	19 (1.4)	30 (1.5)	32 (1.5)
Chile	48 (1.3)	Czech Republic	5 (0.5)	25 (2.0)	31 (2.2)	39 (2.4)
Chinese Taipei ^a	57 (1.6)	Finland	21 (1.1)	24 (1.4)	70 (1.3)	80 (1.0)
Cyprus	48 (1.7)	Hungary	8 (0.6)	11 (0.9)	21 (1.2)	20 (1.6)
England	89 (1.1)	Latvia (LSS)	--	22 (1.3)	30 (1.8)	34 (1.6)
Hong Kong, SAR	77 (1.2)	Lithuania [†]	--	--	--	--
Indonesia ^b	29 (1.2)	Macedonia, Rep. of	30 (1.3)	41 (1.3)	48 (1.5)	46 (1.6)
Iran, Islamic Rep.	34 (1.3)	Moldova	30 (1.3)	34 (1.4)	38 (1.2)	33 (1.2)
Israel	56 (1.6)	Morocco	x x	s 60 (1.6)	x x	x x
Italy	18 (1.1)	Netherlands ^c	5 (0.8)	20 (2.2)	41 (2.9)	--
Japan	79 (1.7)	Romania	23 (1.3)	25 (1.4)	33 (1.5)	37 (1.7)
Jordan	49 (1.2)	Russian Federation	13 (0.9)	20 (1.0)	41 (1.6)	41 (1.8)
Korea, Rep. of	46 (1.5)	Slovak Republic	8 (0.8)	19 (1.3)	33 (1.7)	33 (1.7)
Malaysia	43 (1.7)	Slovenia	--	17 (1.1)	33 (1.4)	32 (1.8)
New Zealand	82 (1.0)	International Avg.	15 (0.3)	27 (0.4)	39 (0.5)	39 (0.5)
Philippines	66 (1.1)					
Singapore	65 (1.4)					
South Africa	58 (1.2)					
Thailand	50 (1.3)					
Tunisia	68 (1.0)					
Turkey	30 (1.0)					
United States	65 (1.5)					
International Avg.	57 (0.3)					

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by students.

* Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.

^b Indonesia: Students were asked about 'IPA science'; data pertain to the composite course taught by biology and physics teachers.

^c Netherlands: Data in physics panel pertain to physics/chemistry course.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (-) indicates data are not available.

An "s" indicates a 50-69% student response rate. An "x" indicates a <50% student response rate.

Percentage of Students Reporting Almost Always or Pretty Often

Countries with General/Integrated Science		Countries with Separate Science Subjects							
		Earth Science		Biology		Physics		Chemistry	
	Percent of Students 1999	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference	Percent of Students 1999	1995-1999 Difference
Australia	81 (1.3)	8 (0.7)	-3 (1.3)	36 (1.6)	-7 (2.4)	61 (3.1)	-11 (4.2)	--	--
Canada	69 (1.4)	5 (0.5)	2 (0.7)	25 (2.0)	5 (2.5)	31 (2.2)	2 (3.0)	39 (2.4)	4 (3.3)
Cyprus	48 (1.7)	8 (0.6)	2 (0.9)	11 (0.9)	4 (1.0)	21 (1.2)	1 (1.6)	20 (1.6)	0 (2.3)
England	89 (1.1)	--	--	22 (1.3)	-14 (2.1)	30 (1.8)	-16 (2.6)	34 (1.6)	-16 (2.8)
Hong Kong, SAR	77 (1.2)	--	--	--	--	--	--	--	--
Iran, Islamic Rep.	34 (1.3)	5 (0.8)	-1 (1.1)	20 (2.2)	0 (3.4)	41 (2.9)	-8 (4.0)	--	--
Israel †	56 (1.8)	23 (1.3)	-9 (1.9)	25 (1.4)	-9 (1.8)	33 (1.5)	-16 (2.2)	37 (1.7)	-13 (2.4)
Italy	17 (1.3)	13 (0.9)	0 (1.4)	20 (1.0)	3 (1.4)	41 (1.6)	-3 (2.3)	41 (1.8)	-5 (3.0)
Japan	79 (1.7)	8 (0.8)	-4 (1.1)	19 (1.3)	1 (1.7)	33 (1.7)	3 (2.3)	33 (1.7)	8 (2.2)
Korea, Rep. of	46 (1.5)	--	--	17 (1.1)	2 (1.7)	33 (1.4)	2 (2.1)	32 (1.8)	7 (2.6)
New Zealand	82 (1.0)	10 (0.3)	-1 (0.4)	22 (0.5)	-1 (0.7)	36 (0.7)	-4 (0.9)	34 (0.7)	-1 (1.0)
Singapore	65 (1.4)	--	--	--	--	--	--	--	--
Thailand †	50 (1.3)	--	--	--	--	--	--	--	--
United States	65 (1.5)	--	--	--	--	--	--	--	--
International Avg. §	63 (0.4)	10 (0.3)	-1 (0.4)	22 (0.5)	-1 (0.7)	36 (0.7)	-4 (0.9)	34 (0.7)	-1 (1.0)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

▲ 1999 significantly higher than 1995

● No significant difference between 1995 and 1999

▼ 1999 significantly lower than 1995

Significance tests adjusted for multiple comparisons

Background data provided by students.

* Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.

† Countries with unapproved sampling procedures at the classroom level in 1995.

‡ Netherlands: Data in physics panel pertain to physics/chemistry course.

§ International average is for countries that participated and met sampling guidelines in both 1995 and 1999.

Trend notes: Because coverage fell below 65% in 1995 and 1999, Latvia is annotated LSS for Latvian-Speaking Schools only. Lithuania tested later in 1999 than in 1995, at the beginning of the next school year. In 1995, Italy and Israel were unable to cover their International Desired Population; 1999 data are based on their comparable populations.

Background data for Bulgaria and South Africa are unavailable for 1995.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

Percentage of Students Reporting Almost Always or Pretty Often						
Countries with General/ Integrated Science		Countries with Separate Science Subjects				
		Earth Science	Biology	Physics	Chemistry	
Australia	46 (1.1)	Belgium (Flemish)	29 (0.9)	35 (1.1)	40 (1.8)	--
Canada	51 (0.9)	Bulgaria	31 (1.7)	30 (1.1)	34 (1.3)	30 (1.2)
Chile	53 (0.9)	Czech Republic	31 (1.4)	37 (1.5)	39 (1.7)	31 (1.4)
Chinese Taipei ^a	66 (1.2)	Finland	25 (1.2)	22 (1.2)	33 (1.7)	33 (1.4)
Cyprus	64 (1.0)	Hungary	30 (1.1)	35 (1.1)	41 (1.3)	33 (1.1)
England	51 (1.2)	Latvia (LSS)	--	55 (1.2)	54 (1.1)	52 (1.1)
Hong Kong, SAR	63 (1.0)	Lithuania [†]	--	--	--	--
Indonesia ^b	23 (1.0)	Macedonia, Rep. of	55 (1.2)	65 (1.0)	61 (1.2)	57 (1.2)
Iran, Islamic Rep.	35 (1.0)	Moldova	42 (1.4)	45 (1.4)	50 (1.3)	43 (1.3)
Israel	45 (1.2)	Morocco	x x	s 49 (1.6)	x x	x x
Italy	31 (1.1)	Netherlands ^c	33 (1.7)	42 (2.0)	31 (1.6)	--
Japan	21 (1.1)	Romania	31 (1.3)	40 (1.3)	36 (1.1)	32 (1.4)
Jordan	59 (1.1)	Russian Federation	39 (1.7)	43 (1.3)	41 (1.1)	37 (1.4)
Korea, Rep. of	39 (1.1)	Slovak Republic	31 (1.2)	29 (1.3)	44 (1.3)	34 (1.2)
Malaysia	49 (1.1)	Slovenia	--	45 (1.3)	37 (1.3)	33 (1.3)
New Zealand	52 (1.0)	International Avg.	34 (0.4)	41 (0.4)	42 (0.4)	38 (0.4)
Philippines	65 (1.0)					
Singapore	64 (1.2)					
South Africa	65 (1.3)					
Thailand	41 (1.2)					
Tunisia	50 (1.1)					
Turkey	34 (1.1)					
United States	50 (1.0)					
International Avg.	49 (0.2)					

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by students.

* Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.

[†] Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.

^b Indonesia: Students were asked about 'IPA science'; data pertain to the composite course taught by biology and physics teachers.

^c Netherlands: Data in physics panel pertain to physics/chemistry course.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An "s" indicates a 50-69% student response rate. An "x" indicates a <50% student response rate.

	Percentage of Students Taught By Teachers						
	Assigning Homework Three Times A Week or More Often		Assigning Homework Once or Twice A Week		Assigning Homework Less Than Once A Week		Never Assigning Homework
	30 Minutes or Less	More Than 30 Minutes	30 Minutes or Less	More Than 30 Minutes	30 Minutes or Less	More Than 30 Minutes	
Australia	21 (2.5)	1 (0.6)	47 (3.5)	7 (1.8)	20 (3.1)	4 (1.3)	0 (0.1)
Belgium (Flemish)	0 (0.0)	0 (0.0)	7 (2.0)	1 (0.6)	68 (3.5)	10 (2.1)	14 (2.4)
Bulgaria	3 (0.6)	0 (0.3)	32 (3.7)	3 (1.0)	50 (3.0)	7 (1.5)	5 (1.2)
Canada	19 (2.7)	6 (2.1)	50 (3.5)	8 (1.8)	14 (2.6)	3 (1.4)	0 (0.3)
Chile ^s	2 (1.1)	1 (0.7)	30 (3.6)	26 (3.6)	27 (3.8)	12 (2.3)	3 (1.3)
Chinese Taipei	8 (2.4)	7 (2.2)	42 (4.3)	19 (3.2)	20 (3.3)	4 (1.6)	0 (0.0)
Cyprus	37 (3.8)	11 (2.4)	35 (4.4)	10 (2.2)	6 (2.5)	1 (0.8)	0 (0.0)
Czech Republic	0 (0.2)	0 (0.0)	20 (2.4)	0 (0.3)	74 (2.5)	1 (0.5)	5 (0.9)
England	3 (1.7)	0 (0.0)	51 (4.3)	37 (4.1)	7 (2.1)	1 (0.8)	0 (0.0)
Finland	25 (3.1)	2 (1.1)	55 (3.0)	3 (1.0)	11 (1.6)	2 (0.9)	0 (0.4)
Hong Kong, SAR ^r	1 (0.8)	1 (0.0)	53 (4.3)	13 (2.8)	19 (3.6)	13 (2.9)	1 (0.0)
Hungary	17 (1.7)	1 (0.6)	49 (2.0)	3 (0.8)	26 (2.0)	1 (0.3)	3 (0.7)
Indonesia ^s	2 (0.8)	5 (1.7)	34 (3.4)	49 (3.8)	5 (1.4)	5 (1.5)	0 (0.0)
Iran, Islamic Rep. ^s	2 (1.0)	10 (2.1)	15 (2.9)	51 (4.4)	7 (2.1)	14 (4.1)	1 (0.8)
Israel	14 (3.1)	6 (1.7)	50 (3.9)	10 (2.4)	16 (2.8)	1 (0.5)	3 (1.7)
Italy	3 (1.4)	8 (2.3)	28 (3.0)	50 (3.4)	8 (1.8)	3 (1.3)	0 (0.4)
Japan ^s	2 (1.1)	1 (1.0)	10 (2.6)	3 (1.3)	43 (4.2)	23 (3.6)	20 (3.4)
Jordan	46 (4.5)	9 (2.4)	35 (4.5)	3 (1.5)	3 (1.5)	2 (1.4)	0 (0.0)
Korea, Rep. of	9 (2.5)	1 (1.0)	27 (3.6)	6 (2.0)	37 (3.8)	16 (2.7)	3 (0.8)
Latvia (LSS)	13 (2.0)	2 (0.8)	62 (3.0)	5 (1.3)	17 (2.3)	1 (0.7)	1 (0.4)
Lithuania [†]	47 (2.7)	7 (1.3)	33 (2.1)	2 (0.7)	10 (1.7)	1 (0.4)	1 (0.4)
Macedonia, Rep. of	6 (1.4)	2 (0.6)	45 (3.0)	9 (1.4)	32 (2.8)	3 (0.9)	2 (0.9)
Malaysia	9 (2.4)	17 (3.4)	36 (4.1)	29 (3.8)	3 (1.5)	6 (2.0)	0 (0.0)
Moldova	27 (2.3)	21 (2.2)	30 (2.3)	21 (2.0)	1 (0.5)	0 (0.3)	0 (0.0)
Morocco	3 (0.8)	2 (0.8)	26 (2.2)	16 (2.2)	34 (3.2)	16 (2.1)	4 (1.2)
Netherlands	6 (1.8)	2 (1.1)	72 (3.2)	4 (1.1)	15 (3.4)	1 (0.4)	1 (0.7)
New Zealand	26 (3.2)	1 (0.7)	43 (3.9)	7 (2.0)	15 (3.0)	5 (1.7)	3 (1.6)
Philippines	72 (3.9)	10 (2.7)	11 (2.6)	6 (1.8)	0 (0.0)	1 (1.0)	0 (0.0)
Romania	6 (1.1)	2 (0.8)	39 (2.1)	5 (1.1)	36 (2.3)	2 (1.0)	8 (1.0)
Russian Federation	12 (1.4)	6 (0.9)	53 (2.5)	26 (2.4)	3 (0.8)	0 (0.2)	0 (0.2)
Singapore	9 (2.6)	5 (1.4)	44 (4.0)	30 (4.1)	11 (2.4)	2 (1.1)	1 (0.6)
South Africa	29 (3.7)	10 (2.8)	38 (4.1)	13 (3.0)	9 (2.7)	1 (0.0)	1 (0.7)
Thailand	11 (2.4)	12 (3.1)	29 (3.8)	45 (4.3)	1 (1.0)	1 (1.0)	0 (0.0)
Tunisia ^s	2 (1.0)	2 (1.1)	23 (3.6)	7 (2.3)	38 (3.9)	20 (3.6)	9 (2.1)
Turkey	11 (2.7)	8 (2.1)	49 (3.7)	16 (3.2)	11 (2.4)	0 (0.4)	4 (1.8)
United States	35 (3.8)	8 (1.4)	32 (3.5)	11 (2.0)	10 (2.1)	2 (0.7)	3 (1.6)
International Avg.	15 (0.4)	5 (0.3)	37 (0.6)	15 (0.4)	20 (0.4)	5 (0.3)	3 (0.2)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

	Sometimes or Always		Never or Rarely	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	46 (3.4)	540 (5.1)	54 (3.4)	539 (6.7)
Belgium (Flemish) r	11 (2.5)	534 (10.5)	89 (2.5)	537 (4.4)
Bulgaria r	15 (2.0)	520 (10.6)	85 (2.0)	510 (4.9)
Canada r	56 (3.4)	532 (3.5)	44 (3.4)	538 (4.6)
Chile	62 (3.8)	427 (5.6)	38 (3.8)	411 (5.1)
Chinese Taipei	6 (2.1)	566 (14.4)	94 (2.1)	569 (4.5)
Cyprus s	43 (4.0)	466 (3.4)	57 (4.0)	461 (4.1)
Czech Republic	12 (1.8)	550 (10.0)	88 (1.8)	540 (4.1)
England s	24 (4.2)	563 (14.3)	76 (4.2)	542 (6.0)
Finland	17 (2.1)	532 (5.2)	83 (2.1)	536 (3.7)
Hong Kong, SAR	10 (2.6)	551 (8.1)	90 (2.6)	527 (4.2)
Hungary	12 (1.5)	554 (7.3)	88 (1.5)	551 (3.9)
Indonesia	--	--	--	--
Iran, Islamic Rep.	24 (3.7)	445 (7.4)	76 (3.7)	450 (4.6)
Israel r	47 (4.0)	465 (8.9)	53 (4.0)	468 (7.0)
Italy	44 (4.1)	493 (5.4)	56 (4.1)	493 (5.3)
Japan r	4 (1.9)	558 (9.0)	96 (1.9)	550 (2.2)
Jordan	36 (4.6)	458 (6.1)	64 (4.6)	445 (4.9)
Korea, Rep. of	35 (4.0)	552 (3.7)	65 (4.0)	547 (3.4)
Latvia (LSS) r	21 (2.6)	508 (6.4)	79 (2.6)	506 (5.3)
Lithuania †	27 (2.5)	504 (6.1)	73 (2.5)	482 (4.5)
Macedonia, Rep. of	32 (2.7)	461 (7.3)	68 (2.7)	457 (5.8)
Malaysia	27 (3.7)	492 (8.4)	73 (3.7)	492 (5.5)
Moldova	32 (2.3)	463 (4.9)	68 (2.3)	458 (4.4)
Morocco	36 (3.2)	320 (4.7)	64 (3.2)	325 (5.6)
Netherlands	27 (2.9)	549 (7.2)	73 (2.9)	544 (8.9)
New Zealand	41 (4.3)	520 (7.9)	59 (4.3)	506 (6.7)
Philippines	72 (4.0)	344 (8.5)	28 (4.0)	344 (14.2)
Romania	31 (2.4)	482 (7.9)	69 (2.4)	465 (6.5)
Russian Federation	29 (2.0)	538 (12.8)	71 (2.0)	526 (5.3)
Singapore	38 (4.3)	575 (11.0)	62 (4.3)	563 (10.0)
South Africa	43 (4.2)	248 (16.0)	57 (4.2)	244 (8.6)
Thailand	70 (4.0)	488 (4.8)	30 (4.0)	470 (6.9)
Tunisia	52 (3.9)	427 (4.3)	48 (3.9)	430 (4.2)
Turkey	34 (3.7)	424 (6.4)	66 (3.7)	436 (5.3)
United States r	58 (3.4)	521 (6.6)	42 (3.4)	519 (5.3)
International Avg.	34 (0.6)	491 (1.4)	66 (0.6)	485 (1.0)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by teachers.

* Based on average response to questions about assigning homework based on small investigation(s) or gathering data, working individually on long term projects or experiments, and working as a small group on long term projects or experiments.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Science teacher background data for Slovak Republic and Slovenia are unavailable.

A dash (–) indicates data are not available.

An "r" indicates teacher response data available for 70-84% of students. An "s" indicates teacher response data available for 50-69% of students.

Exhibit R3.18 Frequency of Having a Quiz or Test in Science Classes*

Percentage of Students Reporting Almost Always or Pretty Often						
Countries with General/ Integrated Science		Countries with Separate Science Subjects				
		Earth Science	Biology	Physics	Chemistry	
Australia	52 (1.3)	Belgium (Flemish)	45 (1.9)	55 (1.5)	58 (2.4)	--
Canada	62 (1.8)	Bulgaria	35 (1.9)	36 (2.2)	42 (1.9)	44 (2.2)
Chile	83 (0.9)	Czech Republic	37 (2.2)	40 (2.1)	38 (1.7)	45 (2.2)
Chinese Taipei ^a	74 (1.3)	Finland	33 (1.4)	34 (1.5)	29 (1.4)	31 (1.6)
Cyprus	83 (0.9)	Hungary	26 (1.2)	26 (1.2)	31 (1.5)	31 (1.3)
England	63 (1.7)	Latvia (LSS)	--	27 (1.5)	23 (1.3)	25 (1.5)
Hong Kong, SAR	36 (1.8)	Lithuania [†]	--	--	--	--
Indonesia ^b	59 (1.3)	Macedonia, Rep. of	38 (1.6)	40 (1.5)	45 (1.5)	43 (1.3)
Iran, Islamic Rep.	66 (1.6)	Moldova	66 (1.3)	69 (1.4)	70 (1.2)	73 (1.2)
Israel	56 (1.6)	Morocco	x x	s 68 (1.7)	s 70 (1.1)	x x
Italy	35 (1.4)	Netherlands ^c	49 (2.7)	56 (3.1)	51 (2.7)	--
Japan	29 (1.8)	Romania	77 (1.4)	78 (1.2)	73 (1.1)	76 (1.2)
Jordan	65 (1.3)	Russian Federation	65 (1.2)	66 (1.5)	75 (1.1)	77 (1.2)
Korea, Rep. of	27 (1.7)	Slovak Republic	38 (2.3)	41 (2.1)	47 (2.0)	62 (2.3)
Malaysia	41 (1.3)	Slovenia	--	57 (1.6)	59 (1.3)	61 (1.3)
New Zealand	57 (1.5)	International Avg.	46 (0.5)	49 (0.5)	51 (0.4)	52 (0.5)
Philippines	74 (1.0)					
Singapore	64 (1.3)					
South Africa	73 (1.1)					
Thailand	65 (1.1)					
Tunisia	63 (1.3)					
Turkey	26 (0.9)					
United States	77 (1.2)					
International Avg.	58 (0.3)					

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

Background data provided by students.

* Countries administered either a general/integrated science or separate subject area form of the questionnaire. In countries that administered the separate subject area form, students were asked about each subject area separately. Percentages for separate science subject areas are based only on those students taking each subject.

† Lithuania tested the same cohort of students as other countries, but later in 1999, at the beginning of the next school year.

^a Chinese Taipei: Students were asked about 'natural science'; data pertain to grade 8 physics/chemistry course.

^b Indonesia: Students were asked about 'IPA science'; data pertain to the composite course taught by biology and physics teachers.

^c Netherlands: Data in physics panel pertain to physics/chemistry course.

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A dash (–) indicates data are not available.

An "s" indicates a 50-69% student response rate. An "x" indicates a <50% student response rate.

