APPENDIX B

Multiple Comparisons of Average Achievement in Science Content Areas





Multiple Comparisons of Average Achievement in Earth Science



Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

U	Hungary Slovenia Chinese Taipei Slovak Republic Netherlands Japan Belgium (Flemish)	Korea, Rep. of Russian Federation England Singapore Finland Bulgaria Australia	Canada Hong Kong, SAR New Zealand United States Italy Latvia (LSS) Malaysia Iffhunaia	Romania Israel Israel Moldova Moldova Macedonia, Rep. of Cyprus Iran, Islamic Rep. Jordan Tunisia Chile Turkey Indonesia Philippines Morocco
Hungary Slovenia				
Chinese Taipei				
Slovak Republic				
Netherlands				
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Czech Republic	V • • • • • •			
Korea, Rep. of	V • • • • • • •			
Russian Federation				
England	V • • • • • • •			
Singapore	v • • • • • •			
Finland	v • • • • • •			
Bulgaria	v • • • • • •			
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Canada	* * * • • • • •		\bullet \bullet \bullet \bullet \bullet \bullet	
Hong Kong, SAR	* * * * * * * *	* * * * • • • •		
New Zealand	* * * * • * * •	V • • • • • •		
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Latvia (LSS)	* * * * * * * * * *	* * * * • • • •	V • • • • • •	
Malaysia	* * * * * * * * *	, , , , , , , , , , , , , , , , , , , 	V • • • • •	
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Romania	* * * * * * * * *	, , , , , , , , , , , , , , , , , , ,	* * * * * • • •	
Israel	* * * * * * * *		* * * * * * * • •	
Thailand	* * * * * * * * *		* * * * * * * * •	
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Cyprus				
Iran, Islamic Rep.				
Jordan				
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SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

- Average achievement significantly higher than comparison country
- No statistically significant difference from comparison country
- Average achievement significantly lower than comparison country

Significance tests adjusted for multiple comparisons

370

Multiple Comparisons of Average Achievement in Life Science



Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

	Chinese Taipei Czech Republic Singapore	Netherlands Slovak Republic	Hungary Belgium (Flemish)	Japan England Australia	Korea, Rep. of Canada	Slovenia Finland	United States	Kussian rederation Hong Kong, SAR	Bulgaria	Latvia (LSS) Thailand	New Zealand	Lithuania Italy	Malaysia	Romania	Cyprus	Macedonia, Rep. ot Israel	Jordan	Indonesia	Turkey	Iran, Islamic Rep.	Chile	Philippines	Morocco South Africa	סמנוו שוויגמ
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Latvia (LSS)	V V V		V V	V • V	▼ •	• •	•	•	•	•	•	• 🔺	A 4			A A			A 4	•		lack	A A	
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SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

- Average achievement significantly higher than comparison country
- No statistically significant difference from comparison country
- Average achievement significantly lower than comparison country

Exhibit B.3

Multiple Comparisons of Average Achievement in Physics



Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

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	Singapore Chinese Taipei Japan Korea, Rep. of Hungany Netherlands Australia Belgium (Flemish) Russian Federation England Czech Republic Slovenia Hong Kong, SAR Canada Firland Bulgaria New Zealand United States Latvia (LSS) Malaysia Israel Italy Macedonia, Rep. of Cyprus Jordan Moldova Indonesia Iran, Islamic Rep. Turkey Chile Tunisia Philippines
	Singapore Chinese Taipei Japan Korea, Rep. of Hungary Netherlands Australia Belgium (Flem Russian Federa England Czech Republii Slovenia Hung Kong, SA Canada Finland Slovak Republii Lithuania Bulgaria New Zealand United States Latvia (LSS) Malaysia Israel Italy Malaysia Israel Italy Malaysia Israel Italy Moldova Indonesia Indonesia Iran, Islamic R Chile Turkey Chile Turkey Philippines
	Singapore Chinese Talapan Korea, Rep Hungary Netherland Australia Belgium (F Russian Fe England Czech Rep Slovenia Hong Kong Canada Finland Slovak Ref Lithuania Bulgaria New Zeala United Stalatvia (USS Malaysia (USS Malaysia (USS Malaysia Coprana Macconii Cyprus Lordan Moldowa Indonesia Iran, Islam Itakey Chile Itakey Moroccoo
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Japan	V • • • • • • • • A A A A A A A A A A A
Korea, Rep. of	
Hungary	
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Australia Belgium (Flemish)	
Russian Federation	
England	V V O O O O O O O O O O O O O O O O O O
Czech Republic	V V V O O O O O O O O O O O O O O O O O
Slovenia	***
Hong Kong, SAR	
Canada Finland	
Slovak Republic	V V V V 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Lithuania	V V V V V O V O O O O O O O O O O O O O
Bulgaria	
New Zealand	
United States	V V V V V V V V V V V V V O O O O O O O
Latvia (LSS)	
Malaysia Israel	V V V V V V V V V V V V V V V V V V V
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Romania	* * * * * * * * * * * * * * * * * * *
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Chile	
Tunisia Philippines	
Morocco	* * * * * * * * * * * * * * * * * * *
South Africa	

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

- Average achievement significantly higher than comparison country
- No statistically significant difference from comparison country
- Average achievement significantly lower than comparison country

Multiple Comparisons of Average Achievement in Chemistry



Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

	Chinese Taipei Hungary	Singapore Finland	Bulgaria Slovak Remithic	England Korea, Rep. of	Russian Federation	Canada Australia	Hong Kong, SAR Netherlands	Czech Republic	Slovenia	United States	Belgium (Flemish) New Zealand	Italy	Latvia (LSS)	Iran, Islamic Rep.	Litnuania Malaysia	ivialaysia Jordan	Romania	Macedonia, Rep. of	Israel	Cyprus Moldova	Tunisia	Thailand	Turkey	Chile	Indonesia	Morocco	South Africa
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SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.

- Average achievement significantly higher than comparison country
- No statistically significant difference from comparison country
- Average achievement significantly lower than comparison country

Exhibit B.5

Multiple Comparisons of Average Achievement in Environmental and Resource Issues



Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

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Iran, Islamic Rep.	* *	* *	·	* *	V	* *	Ť	Ť	Ť	* *	l v	·	¥	V	•	•			•	•	•		•	•	•	•		À	Â	ÂÂ
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Israel Chile	* *	* *	•	* *	*	V V	•	*	*	V V		•	*	*	*	* '		•	_	V	•			•	•				•	
Moldova	* *	* *	•	* *	•	* *	•	•	▼	V			•	•	▼	•	•	· •	_	•	•		•	•	•	•		•	A	A A
Macedonia, Rep. of	▼ ▼	V V	V	▼ ▼	V	V	▼	▼	▼	V	•	•	▼	▼	▼	•	V V		•	▼		•	V V	\blacksquare	▼	•	•			
Morocco		M		M	M	M		M	M	4		M	V	M	Y	4	4	4	V	V	4	4	4	V	V	V	V	Y		• 🛕
Philippines South Africa		V	V	Y Y	V	Y Y		V	¥	Y Y		· ·	¥	V	*		4	4	V	V		4		A	*	V	¥	*	•	
South Airica		_	•	* *	•	* *	V	v	Y	v	1	•	Y	Y	4	V	Y	_	•	V	1	*	V		V	Y	Y	Y	4	

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

- Average achievement significantly higher than comparison country
- No statistically significant difference from comparison country
- Average achievement significantly lower than comparison country

Exhibit B.6

Multiple Comparisons of Average Achievement in Scientific Inquiry and the Nature of Science



Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

	Singapore Korea, Rep. of	Japan Chinese Taipei England Australia	Netherlands Canada Hong Kong, SAR	Belgium (Flemish) Hungary United States	New Zealand Slovenia Slovak Republic	Latvia (LSS) Russian Federation taly	Malaysia Lithuania Bulgaria Israel	Moldova Cyprus Macedonia, Rep. of Thailand Romania	Tunisia Iran, Islamic Rep. Indonesia Turkey Chile Jordan Philippines Morocco	
	Singap Korea,	Chii Chii Aus	Net Can Hor	Belg Hur Can	Nev Slov Slov	Latvia Russia Italy	Malay Lithua Bulgai Israel	Cyp Ma Ma Tha Ron	Tunisi Iran, I Indon Turkey Chile Jordar Philipi Moroc	
Singapore	• •	• • •	• • • •	• • • •						
Korea, Rep. of	•	• • •	• • • •	• • • •	• 🔺 🛦			A A A A		
Japan	• •	• • •	• • • •	• • • •	• • •			A A A A		
Chinese Taipei				• • • •			A A A			
England		•	• • • •	• • • •						
Australia Netherlands			• • • •							1
Netherlands Canada										1
Hong Kong, SAR										1
Finland										
Belgium (Flemish)	• •			• • •						
Hungary		• • •	• • • •	• • •					A A A A A A A	
United States	V • V	7 • • •		• • •						
Czech Republic	V • V		• • • •	• • •	• • •		\triangle \triangle \triangle	A A A A		
New Zealand	• • •	• • •	• • • •	• • • •	• •	• 🛦 🛦				199
Slovenia			• • v •	• • • •	•	• 🔺 🛦				98
Slovak Republic			* * * *	• • • •	• •	• • •	A A A	A A A A		. 19
Latvia (LSS)			* * * *			• •	• • • •		A A A A A A A	SS)
Russian Federation		44N		1444		•	• • • •	• • • • •		IÈ
Italy						• •	• • • •	• • • • •		츌
Malaysia Lithuania		441								St
Bulgaria										ince.
Israel			* * * *							Scie
Moldova	* * *	7 7 7 7	* * * *	V V V V	,	V • •	• • • •	• • • •		and
Cyprus		, , , , ,	* * * *			V V V	V • • •		• • • • • • • •	Š
Macedonia, Rep. of	* * *	, , , ,	* * * *	* * * *	* * *	* * *	v • • •	• • • •		. u
Thailand	* * *	, , ,	* * * *	* * * *	* * *	▼ ▼ ▼	v • • •	• • • •		ig P
Romania	* * *	, , , , ,	* * * *	* * * *	* * *	* * *	V • • •	• • • •		Σ
Tunisia	* * *	7 7 7	* * * *	* * * *	* * *	* * *	* * * •	V • • • •	\bullet \bullet \bullet \bullet \bullet \bullet \bullet	ona
Iran, Islamic Rep.							* * * •	Y • • • •	• • • • • • • •	nati
Indonesia							V V V •	Y Y O O O		nter
Turkey		44 1					* * * •	• • • •		<u>p</u>
Chile						Y Y Y	V V V V	Y Y Y Y		Ę
Jordan			V V V V				V V V V	· · · · ·	V V V V V V A A A	SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1998-1999.
Philippines Morocco	* * .		V V V	V V V V		* * *	* * * *	* * * * *		Ü
South Africa	* * *	, , , , ,	V V V V	V V V V		* * *	* * * *	* * * * *	V V V V V V V V	J.R.
Journ Amica							•			S

- Average achievement significantly higher than comparison country
- No statistically significant difference from comparison country
- Average achievement significantly lower than comparison country

