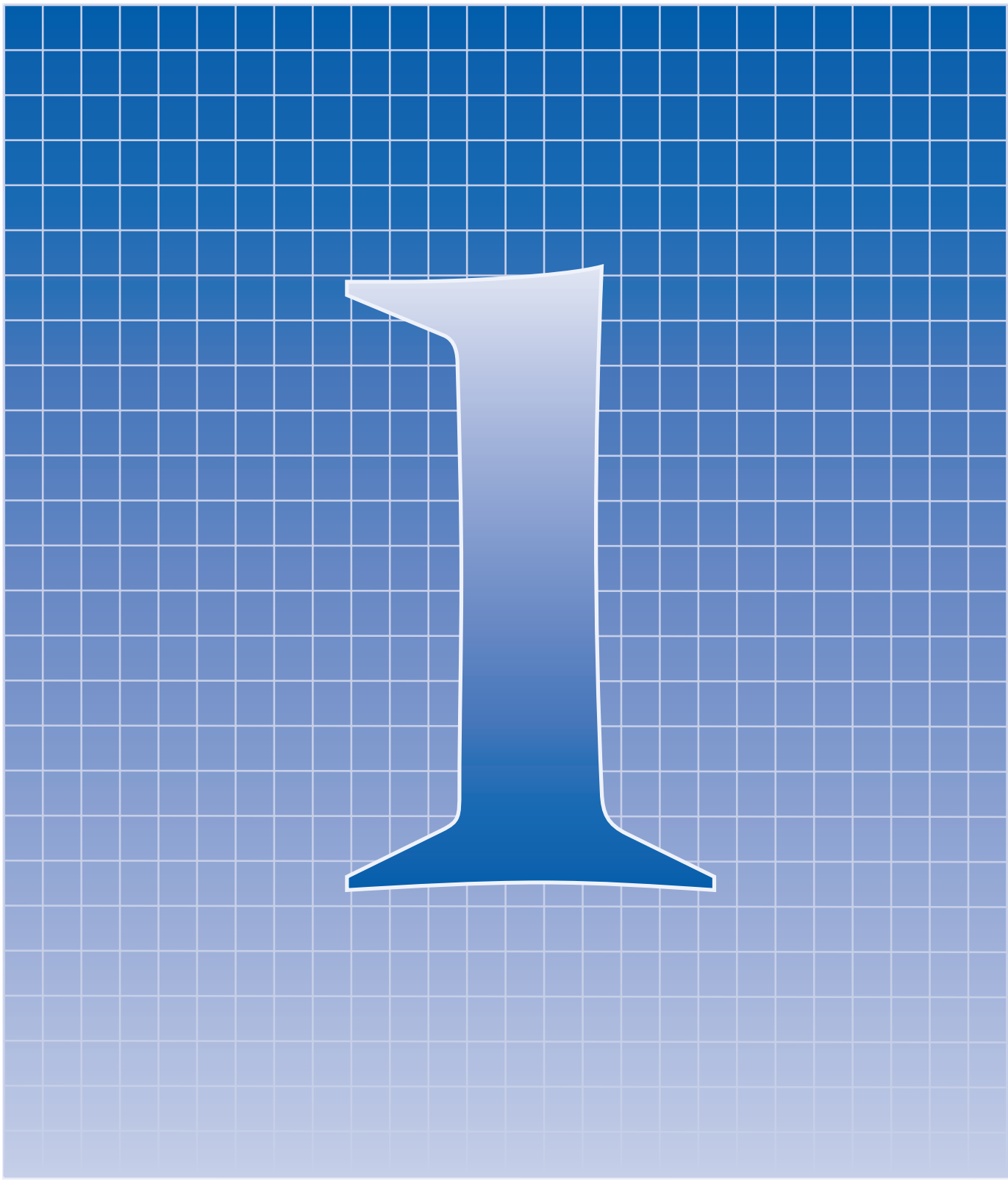
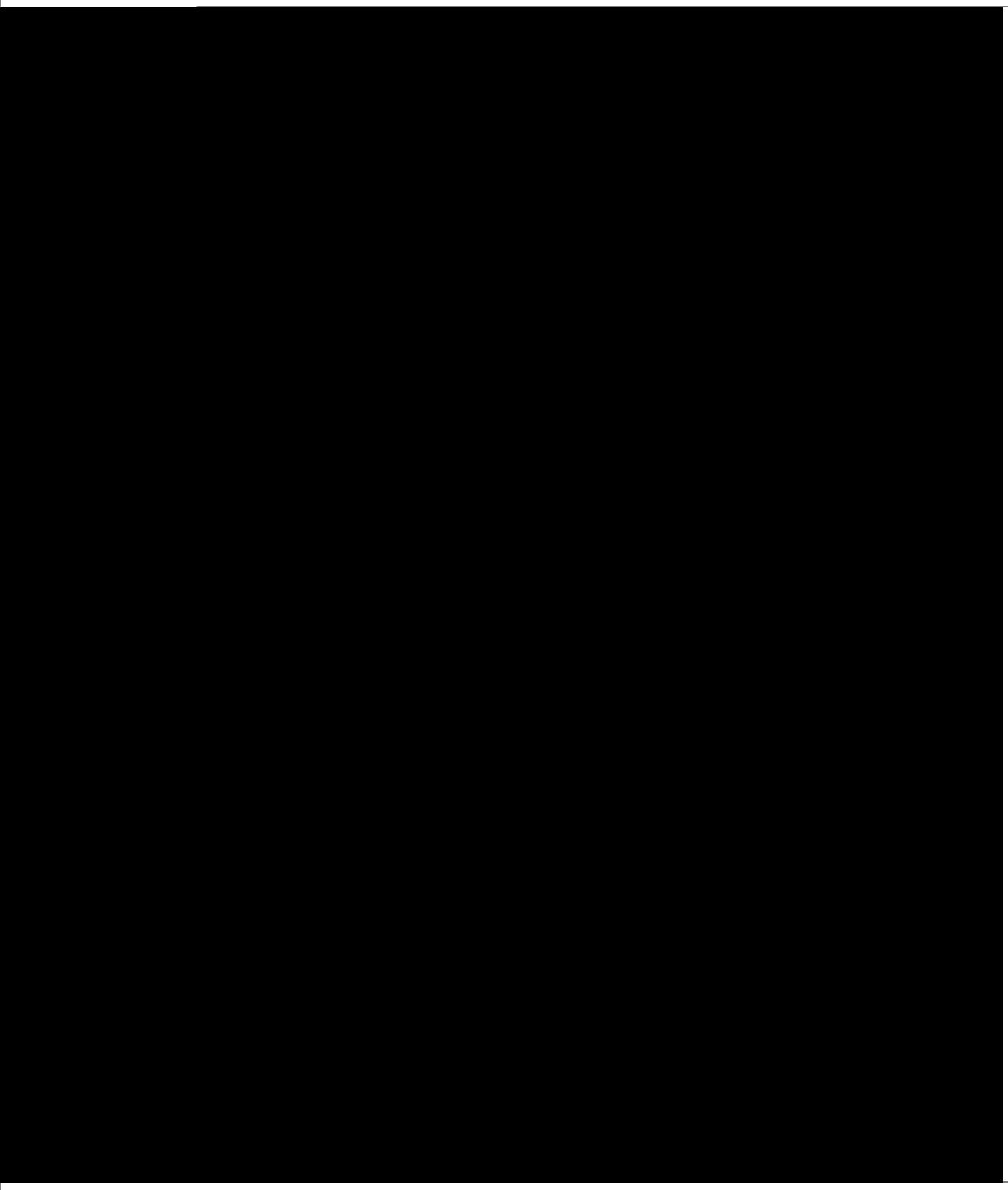


Chapter 1

International Student Achievement in Mathematics

Chapter 1 summarizes achievement for eighth- and fourth-grade students on the TIMSS 2003 mathematics assessment for each of the participating countries. It also shows trends in student performance at the eighth grade for those countries that also participated in TIMSS 1995 and 1999. At the fourth grade, trends are presented for those countries that participated in the 1995 assessment (no assessment was condu9in TIMpi 0 7Su



3 Even though England worked very hard to meet the TIMSS sampling requirements and adjustments were made to represent the results re

Exhibit 1.1: A

MATHEMATICS Grade 8

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Exhibit 1.1:

MATHEMATICS Grade 4

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

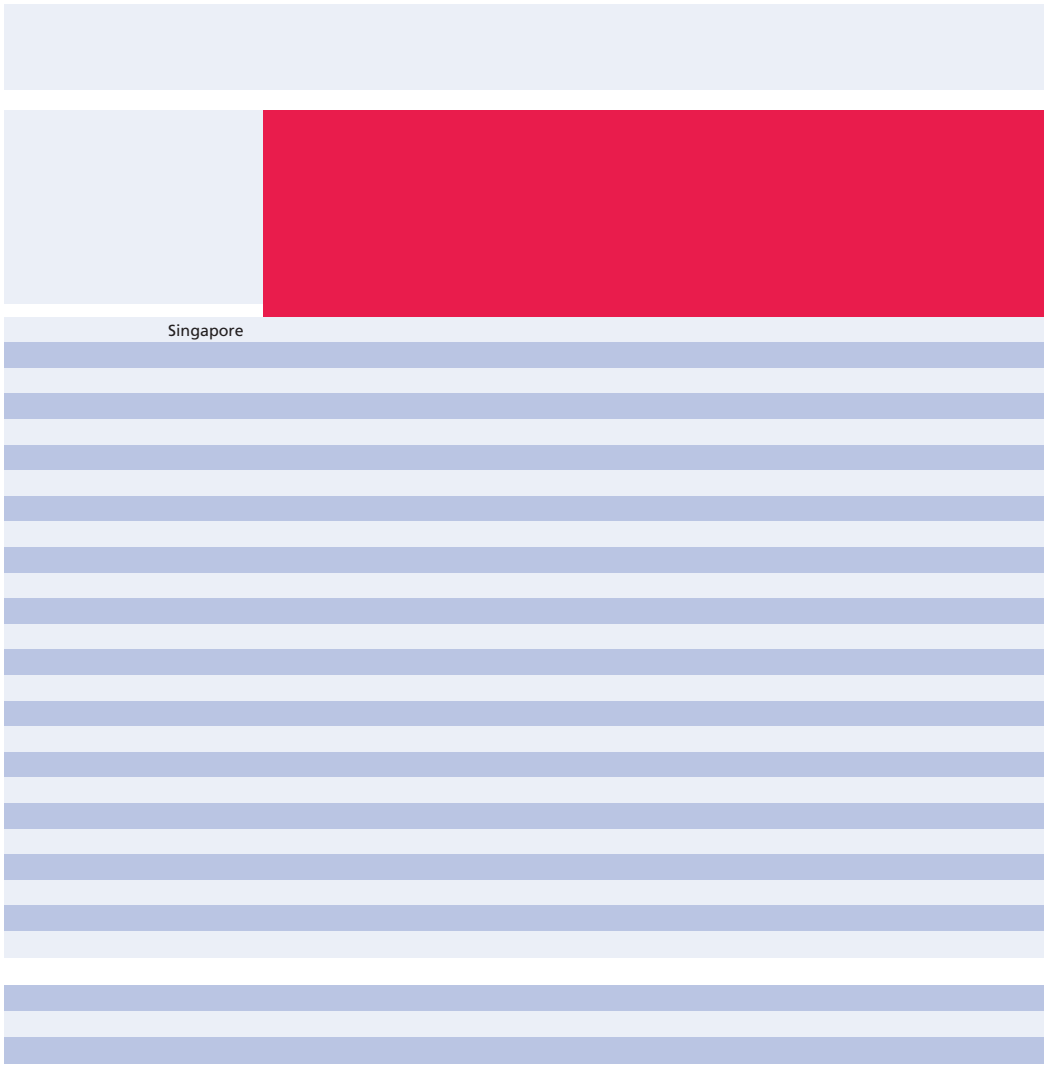
countries have different policies about the age at which students begin formal schooling and different policies about promotion and retention from grade to grade.

At the eighth grade, the aim was that the students assessed would have had eight years of formal schooling. Most notably, students in Norway, most of Slovenia, and parts of the Russian Federation had fewer years of formal schooling than their counterparts in other countries, while those in England, Scotland, New Zealand, and parts of Australia had more years of schooling. Even though the students assessed at the eighth grade typically averaged between 14 and 15 years old, the variety of countries assessed and their situations also resulted in a considerable range in the average age of the students assessed. To illustrate how education policies can affect the interaction between age and number of years of schooling, it is interesting to note that Scotland, one of the few countries with an additional year of schooling, starts formal schooling at an early age and had the youngest students assessed—13.7 years old on average. Other countries assessing students younger than 14 years old included Slovenia, Norway, and Cyprus with 13.8 and Australia, Jordan, and Italy with 13.9. Students in the Balkans and some Eastern European countries start school later and tended to be older, particularly in Estonia with an average of 15.2. Students also were older in several African countries including Botswana and South Africa both averaging 15.1, Morocco averaging 15.2, and Ghana averaging 15.5. In these countries, it is not unusual for students to start school at an older age and also perhaps to find it necessary to interrupt their schooling.

At the fourth grade, the aim was to assess students having had four years of formal schooling and this was the case for the most part. However, some students in Slovenia and parts of the Russian Federation had only three years of formal schooling, and students in England and Scotland as well as some in Australia and New Zealand had five years. In terms of chronological age, students in most countries averaged between 10 and 11 years old. Consistent with the patterns at the eighth grade, students were somewhat younger in Scotland, averaging 9.7 years old; Italy,

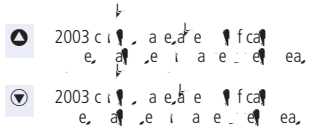
TIMSS2003

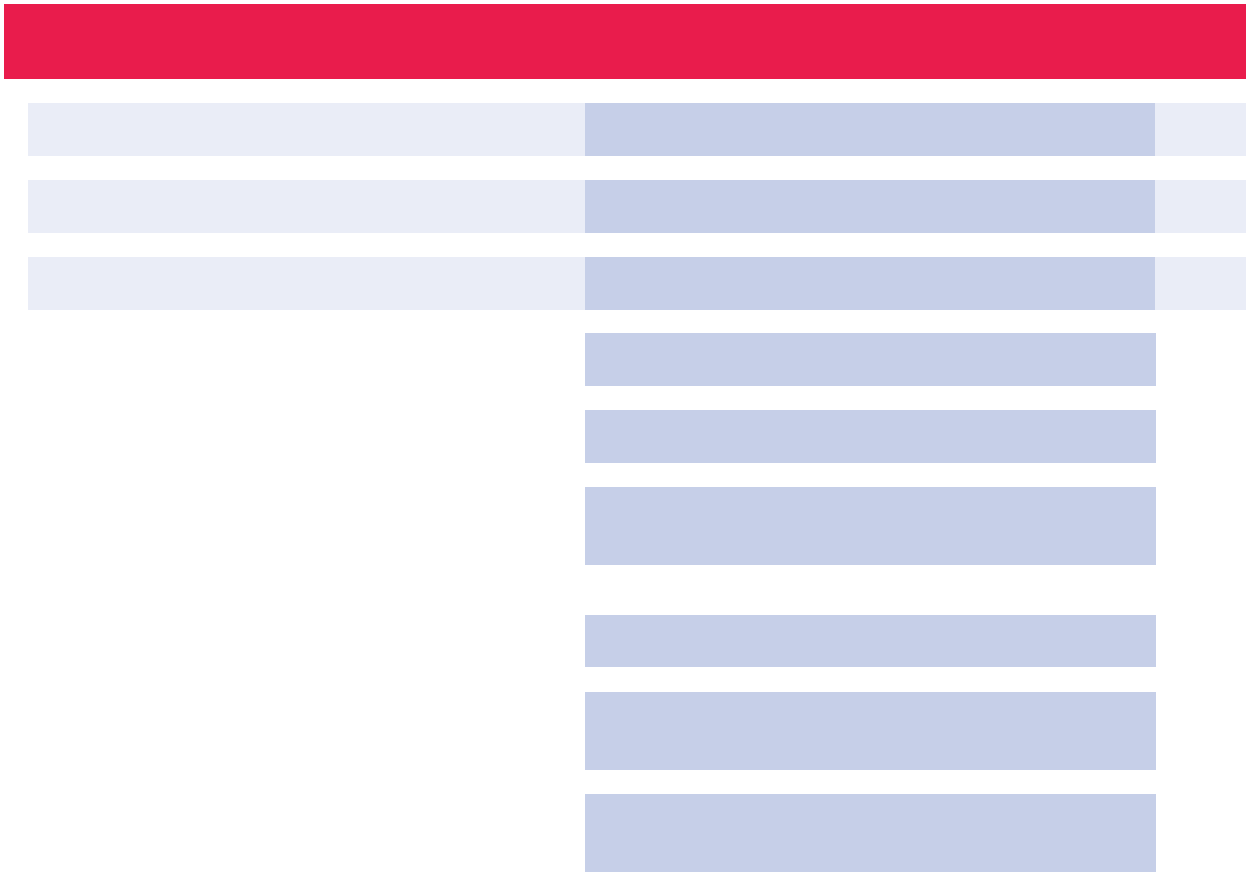
MATHEMATICS
Grade



SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Co n ie	Average Scale Score	1999 to 2003 Difference	1995 to 2003 Difference	Ma hema ic Achie emen Di ib ion	Average Age
Singapore					
2003	605 (3.6)				14.3
1999	604 (6.3)	1 (7.2)			14.4
1995	609 (4.0)		-3 (5.4)		14.5
Korea, Rep. of					
2003	589 (2.2)				14.6
1999	587 (2.0)	2 (2.9)			14.4
1995	581 (2.0)		8 (3.0) ▲		14.2
Hong Kong, SAR					
2003	586 (3.3)				14.4
1999	582 (4.3)	4 (5.4)			14.2
1995	569 (6.1)		17 (7.0) ▲		14.2
Chinese Taipei					
2003	585 (4.6)				14.2
1999	585 (4.0)	0 (6.0)			14.2
Japan					
2003	570 (2.1)				14.4
1999	579 (1.7)	-9 (2.6) ▼			14.4
1995	581 (1.6)		-11 (2.6) ▼		14.4
Belgium (Flemish)					
2003	537 (2.8)				14.1
1999	558 (3.3)	-21 (4.1) ▼			14.1
1995	550 (5.9)		-13 (6.5) ▼		14.1
Netherlands					
2003	536 (3.8)				14.3
1999	540 (7.1)	-4 (8.1)			14.2
1995	529 (6.1)		7 (7.3)		14.4
Hungary					
2003	529 (3.2)				14.5
1999	532 (3.7)	-2 (4.9)			14.4
1995	527 (3.2)		3 (4.5)		14.3
Malaysia					
2003	508 (4.1)				14.3
1999	519 (4.4)	-11 (6.0)			14.4
Russian Federation					
2003	508 (3.7)				14.2
1999	526 (5.9)	-18 (7.1) ▼			14.1
1995	524 (5.3)		-16 (6.5) ▼		14.0
Slovak Republic					
2003	508 (3.3)				14.3
1999	534 (4.0)	-26 (5.1) ▼			14.3
1995	534 (3.1)		-26 (4.4) ▼		14.3
Latvia (LSS)					
2003	505 (3.8)				15.1
1999	505 (3.4)	0 (5.1)			14.5
1995	488 (3.6)		17 (5.2) ▲		14.3
Australia					
2003	505 (4.6)				13.9
1995	509 (3.7)		-4 (6.0)		13.9
United States					
2003	504 (3.3)				14.2
1999	502 (4.0)	3 (5.2)			14.2
1995	492 (4.7)		12 (5.8) ▲		14.2





Co n ie	Average Scale Score	1995 to 2003 Difference	Ma hema ic Achie emen Di ib ion	Average Age
Singapore				
2003	594 (5.6)			10.3
1995	590 (4.5)	4 (7.2)		10.3
Hong Kong, SAR				
2003	575 (3.2)			10.2
1995	557 (4.0)	18 (5.0) ▲		10.1
Japan				
2003	565 (1.6)			10.4
1995	567 (1.9)	-3 (2.5)		10.4
Netherlands				
2003	540 (2.1)			10.2
1995	549 (3.0)	-9 (3.7) ▼		10.3
Latvia (LSS)				
2003	533 (3.1)			11.1
1995	499 (4.6)	34 (5.5) ▲		10.5
England				
2003	531 (3.7)			10.3
1995	484 (3.3)	47 (5.0) ▲		10.0
Hungary				
2003	529 (3.1)			10.5
1995	521 (3.6)	7 (4.8)		10.4
United States				
2003	518 (2.4)			10.2
1995	518 (2.9)	0 (3.8)		10.2
Cyprus				
2003	510 (2.4)			9.9
1995	475 (3.2)	35 (4.1) ▲		9.8
Australia				
2003	499 (3.9)			9.9
1995	495 (3.4)	4 (5.2)		9.9
New Zealand				
2003	496 (2.1)			10.0
1995	469 (4.4)	26 (4.9) ▲		10.0
Scotland				
2003	490 (3.3)			9.7
1995	493 (4.2)	-3 (5.3)		9.7
Slovenia				
2003	479 (2.6)			9.8
1995	462 (3.1)	17 (4.1) ▲		9.9
Norway				
2003	451 (2.3)			9.8
1995	476 (3.0)	-25 (3.7) ▼		9.9
Iran, Islamic Rep. of				
2003	389 (4.2)			10.4
1995	387 (5.0)	2 (6.5)		10.5
Benchma king Pa icipan				
Ontario Province, Can.				
2003	511 (3.8)			9.8
1995	489 (3.5)	23 (5.2) ▲		9.9
Quebec Province, Can.				
2003	506 (2.4)			10.1
1995	550 (4.2)	-44 (4.8) ▼		10.3

countries and Ontario and Quebec also participated in TIMSS 1995. Since TIMSS was not conducted at the fourth grade in 1999, these participants can track changes in student achievement over an eight-year period, between 1995 and 2003.

For the countries participating in assessments prior to TIMSS 2003, Exhibit 1.3 compares average achievement between the years.[8] Countries are presented in descending order according to their average TIMSS 2003 achievements. At the eighth grade, a number of countries had significantly higher achievement in TIMSS 2003 than in previous assessments. Most notably, Korea, Hong Kong SAR, the US, Latvia (LSS), Lithuania, and Ontario have shown a pattern of improvement with significant change over the 8-year period. For Lithuania, the increase between 1995 and 1999 also was significant. Israel and the Philippines showed significant improvement from 1999 to 2003. Countries showing a decrease at the eighth grade in TIMSS 2003, from 1995, 1999, or both, included Japan, Belgium (Flemish), the Russian

			Scored Higher	B Scored Higher
† Hong Kong, SAR	47 (1.1)	575 (3.4)		(1.1) (3.46019537.6((3.4)m9.2601 0 0 6.9

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

assessments in Hong Kong SAR, Korea, Latvia (LSS), and Scotland.