Exhibit 8.1:

MATHEMATICS
Grade

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

Background data provided by schools.

‡ Did not satisfy guidelines for sample participation rates (see Exhibit A.9).

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

A dash (–) indicates comparable data are not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data

Exhibit 8.1: Principals' Reports on the Percentages of Students in Their Schools Coming from Economically Disadvantaged Homes

MATHEMATICS Grade 4

	P`ellip tfqe Cbt %-*.-"& B`lkljf^iiv Afp^as^kq^dba Pqrabkqp		P`ellip tfqe ..*/2" B`lkljf^iiv Afp^as^kq^dba Pqrabkqp		P`ellip tfqe /3*2-" B`lkljf^iiv Afp^as^kq^dba Pqrabkqp		P`ellip tfqe Jlobqe^k 2-" B`lkljf^iiv Afp^as^kq^dba Pqrabkqp	
	Mbo`bkq lc Pqrabkqp	>sbo^db >`efbsbjbkq	Mbo`bkq lc Pqrabkqp	>sbo^db >`efbsbjbkq	Mbo`bkq lc Pqrabkqp	>sbo^db >`efbsbjbkq	Mbo`bkq lc Pqrabkqp	>sbo^db >`efbsbjbkq
>ojbkf^ o	1 %.+4&	14. %/6+3&	/. %0+2&	124 %5+2&	/5 %1+.&	120 %5+0&	15 %1+3&	122 %3+/&
>rpqo^if^	01 %1+1&	2/- %4+.&	0- %1+-&	165 %3+3&	/. %0+3&	153 %4+1&	.2 %1+-&	123 %..+.&
?bidfrj %Cibjfpe&	26 %1+1&	225 %.+6&	/4 %1+-&	22/ %0+2&	4 %/+.&	2/. %2+/&	4 %/+4&	2.3 %.3+-&
@efkbpb Q^fmbf	5- %0+1&	234 %/+.&	.2 %0+-&	226 %0+.&	1 %.+2&	2/. %.4+2&	/ %-+6&	{ {
@vmorp	25 %1+2&	2.5 %0+-&	0- %1+1&	2-/ %2+-&	3 %/+/&	2-6 %5+3&	2 %.+.&	15/ %.0+3&
Bkdi^ka o	05 %1+1&	226 %4+-&	/2 %1+2&	2/5 %3+6&	.. %0+-&	2/6 %./+/&	/2 %1+/&	151 %5+5&
Elkd Hlkd) P>O	/0 %1+1&	26. %2+5&	/3 %0+2&	241 %3+.&	/2 %1+6&	246 %3+1&	/2 %1+1&	226 %2+3&
Erkd^ov	.2 %0+0&	222 %3+2&	/1 %1+/&	200 %2+5&	0. %1+-&	20- %3+2&	0- %0+3&	2-2 %3+0&
Fo^k) Fpi^ jf` Obm+ lc	.4 %0+2&	1/6 %.-+0&	.. %0+/&	065 %.-+5&	// %1+0&	061 %6+.&	2- %1+4&	036 %2+6&
Fq^iv	13 %1+.&	2.- %0+5&	04 %0+5&	2-/ %3+4&	.- %/+1&	145 %.-+4&	5 %.+3&	162 %.6+0&
G^m^k	41 %0+6&	233 %/+-&	// %0+3&	226 %0+1&	1 %.+2&	226 %..+-&	- %-+-&	{ {
I^qsf^	/0 %0+4&	221 %2+1&	1/ %1+5&	210 %1+6&	// %1+-&	2/- %5+5&	.1 %0+0&	2-4 %4+2&
Ifqer^kf^	/3 %0+5&	23- %3+2&	00 %1+2&	21- %2+5&	0. %0+5&	2.0 %2+-&	.. %/+6&	2./ %6+4&
Jlials^) Obm+ lc o	.- %0+-&	163 %/4+2&	.4 %0+.&	2-6 %.-+-&	0. %1+4&	2-2 %.1+1&	10 %2+/&	165 %3+4&
Jlol``l o	0 %.+/&	02/ %01+6&	1 %.+2&	005 %..+2&	.5 %0+2&	004 %..+2&	42 %0+5&	02/ %3+1&
Kbqeboi^kap	31 %1+-&	22/ %/+.&	.4 %0+2&	21- %2+.&	5 %/+2&	2// %5+/&	.- %/+-&	163 %.-+/&
Kbt Wb^i^ka	11 %0+/&	2/3 %0+6&	// %0+2&	16. %2+3&	./ %/+0&	141 %3+4&	// %/+2&	111 %4+-&
Klot^v	¬ ¬	¬ ¬	¬ ¬	¬ ¬	¬ ¬	¬ ¬	¬ ¬	¬ ¬
Mefifmmfkbp	./ %/+4&	035 %/1+/&	.1 %0+2&	052 %/0+2&	/2 %0+6&	002 %.-+1&	15 %1+5&	012 %5+-&
Orppf^k Cbabo^qflk	.5 %/+2&	215 %.-+2&	00 %0+3&	20. %5+/&	/3 %0+-&	203 %4+5&	/0 %0+3&	2./ %5+3&
P`lqi^ka o	03 %1+2&	2-6 %1+1&	0. %1+3&	156 %1+3&	.4 %1+0&	136 %2+0&	.2 %0+1&	126 %3+0&
Pfkd^mlob	31 %0+4&	3-5 %4+-&	/2 %0+/&	235 %6+2&	3 %.+4&	231 %/0+4&	1 %.+3&	242 %.6+1&
Pilsbkf^	/1 %1+-&	152 %2+6&	10 %1+3&	145 %1+0&	// %1+-&	14- %3+0&	.. %/+4&	150 %6+1&
Qrkfpf^	/- %0+.&	054 %..+1&	.3 %/+6&	001 %./+.&	.2 %0+-&	004 %./+.&	16 %0+3&	0.5 %3+4&
Rkfqba Pq^qbp	.6 %/+5&	23. %1+.&	/0 %/+3&	21. %1+4&	/- %/+6&	2/0 %1+5&	05 %/+3&	151 %0+0&
Fkqbok^qflk^i >sd+	01 %-+4&	2.2 %/+4&	/2 %-+5&	165 %.+4&	.5 %-+4&	153 %/+/&	/1 %-+4&	135 %/+.&
Fkaf^k^ Pq^qb) RP	.6 %1+2&	225 %4+.&	/4 %3+/&	216 %2+2&	/5 %3+3&	2/5 %2+4&	/3 %0+6&	2-0 %3+0&
Lkq^ofl Molsfk`b) @^k+	15 %2+2&	2/- %1+1&	/- %1+.&	2// %.1+0&	.2 %0+5&	2-/ %5+5&	.4 %1+.&	15/ %3+-&
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Background data provided by schools.

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

A dash (–) indicates comparable data are not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70 but less than 85% of the students.

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

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

Armenia	r	95 (1.9)	r	55 (4.3)	r	72 (4.2)	r	94 (2.2)	r	88 (2.7)
Australia		97 (1.6)		95 (2.2)		91 (2.8)		97 (1.9)		92 (2.6)
Belgium (Flemish)		60 (4.6)		42 (4.6)		84 (3.4)		98 (1.2)		4 (1.5)
Chinese Taipei		100 (0.0)		73 (3.6)		99 (0.6)		100 (0.0)		90 (2.1)
Cyprus		95 (2.2)		90 (3.0)		52 (4.9)		99 (0.8)		77 (4.5)
England		– –		– –		– –		– –		– –
Hong Kong, SAR		98 (1.2)		79 (4.2)		99 (0.9)		99 (0.8)		52 (4.5)
Hungary		84 (3.0)		60 (4.4)		91 (2.2)		94 (2.2)		50 (3.4)
Iran, Islamic Rep. of		88 (2.2)		88 (2.7)		83 (3.5)		98 (1.2)		75 (4.3)
Italy		100 (0.0)		37 (3.7)		63 (3.6)		97 (1.4)		63 (3.1)
Japan		97 (1.5)		8 (2.5)		94 (1.9)		80 (3.5)		

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

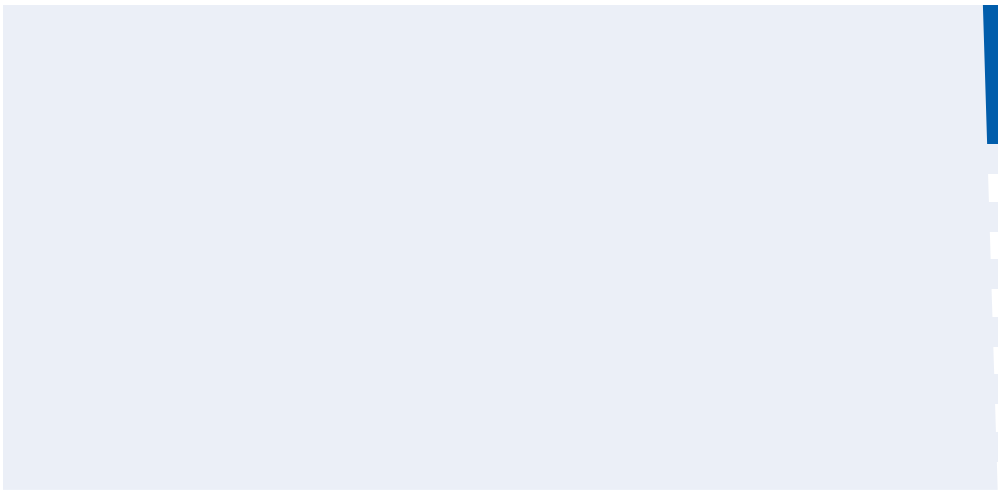
What School Resources Are Available to Support Mathematics Learning?

Some school resources are specific to mathematics, but many are general resources that improve learning opportunities across the curriculum. All the available resources, however, can work together to support mathematics learning and instruction.

To measure the extent of school resources in each of the participating countries, TIMSS created an index of availability of school resources for mathematics instruction. As described in Exhibit 8.3, the index is based on schools' average response to five questions about shortages that affect general capacity to provide instruction and five questions about shortages that affect mathematics instruction in par-

Exhibit 8.3

Exhibit 8.3:



International Avg.	33 (0.7)	26 (1.1)	▲	58 (0.9)	68 (1.2)	▼	10 (0.5)	6 (0.6)	▲

What Are the Perceptions of School Climate?

The school environment establishes the climate for learning. To measure the extent to which schools offer a positive school climate, TIMSS created two new indices in 2003 – one measuring the views of principals and the other the views of teachers. The results for the Index of Principals' Perception of School Climate are presented in Exhibit 8.4. On a scale from very high to very low, the index was based on principals' characterizations of the following:

- teachers' job satisfaction;
- teachers' understanding of the school's curricular goals;
- teachers' degree of success in implementing the schools' curricula;
- teachers' expectations for students' achievement;
- parental support for student's achievement;
- parental involvement in schools' ac T
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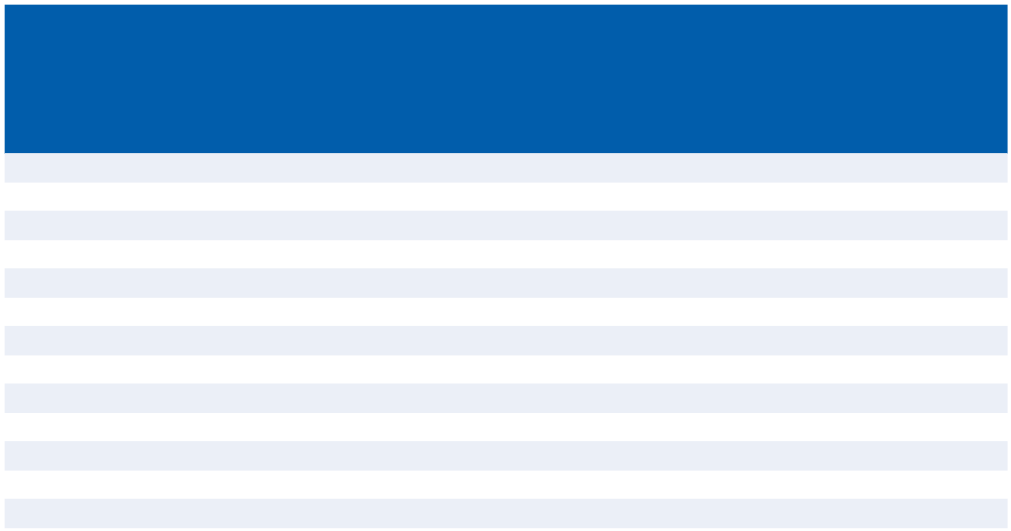
United States		43	(3.2)	534	(4.9)	49	(3.3)	491	(5.1)	8	(1.9)	470	(7.0)
Scotland	s	42	(4.3)	527	(7.7)	52	(4.7)	490	(7.2)	6	(2.6)	459	(34.5)
Chinese Taipei		37	(3.8)	601	(7.9	(7.7)		491	(7.3)	8		6	(7.2)		52	49

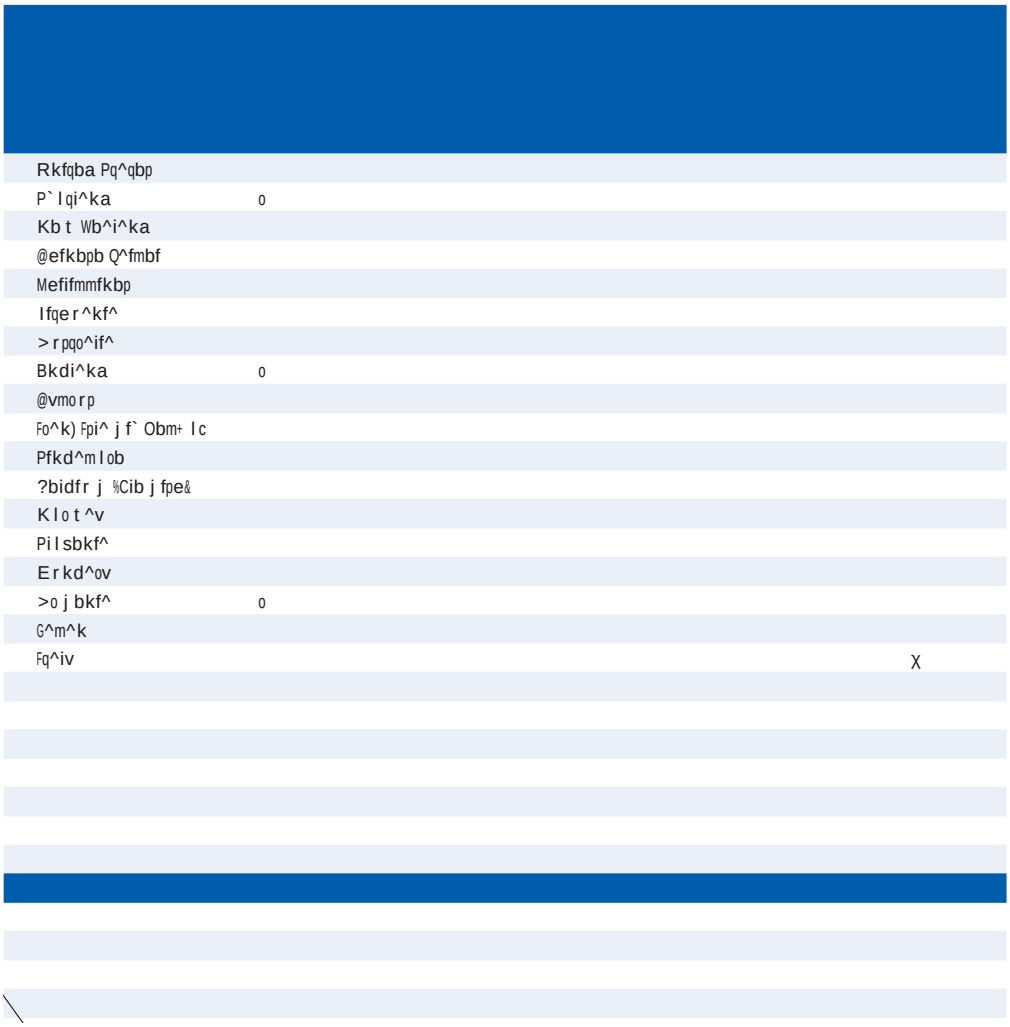
SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

Exhibit 8.5:



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

Exhibit 8.5:



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

there was a strong positive relationship between the principals' perception of school climate and average mathematics achievement.

The Index of Mathematics Teachers' Perception of School Climate is presented in Exhibit 8.5. It is based on the teachers' characterizations of the same aspects of school climate as were characterized by the principals (see list above). As can be seen from the results, fourth-grade teachers were in considerable agreement with principals, also placing two-thirds of the fourth-grade students in the medium category. According to their teachers, internationally, on average, 20 percent of the students attended schools in the high category and 13 percent attended schools in the low category. At the eighth grade, teachers had a somewhat more gloomy view of the climates in schools than did the principals. According to their teachers, on average, 10 percent of the eighth-grade students were attending schools in the high category. Sixty percent were attending schools in the medium category and 30 percent in the low category. Similar to the results for the principals, at both grades, there was a positive relationship between higher reports from teachers and higher average mathematics achievement.

How Serious Are School Attendance Problems?

In some countries, schools are confronted with high rates of absenteeism, which can influence instructional continuity and reduce the time for learning. In general, research has shown that greater truancy is related to less serious attitudes towards school and lower academic achievement. To examine this issue, TIMSS developed an index of good school and class attendance based on schools' responses to three questions about the seriousness of students' absenteeism, arriving late at school, and skipping class. The high index level indicates schools reported that all three behaviors are not a problem. The low level indicates that two or more are a serious problem, or two are minor problems and the third a serious problem. The medium category includes all other possible combinations of responses.

The results of the index for TIMSS 2003 are presented in Exhibit 8.6, which also contains trends between 1999 and 2003 at the eighth grade. At the eighth grade, the results show very little change, on average, in attendance problems. Considering the two assessments, the high category did show a small (statistically significant) increase from 21 percent in 1999 to 23 percent in 2003. Nevertheless, the overwhelming majority of the students – 58 to 59 percent – were in the medium category in both years, and about one-fifth (19-20%) were in the low category. Student attendance problems remain a serious problem in many countries, decreasing in five countries but increasing in four others during the same four-year period. At the fourth grade in 2003, 47 percent of students, on average, internationally, were in the high category, where principals had judged their schools to have few if any attendance problems. Another 47 percent of the students were in schools at the medium level of the index where principals reported moderate attendance problems. Only 5 percent were in schools at the low index level.

Exhibit 8.6:

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

How Safe and Orderly Are Schools?

Since school safety is central for providing an environment conducive to learning, TIMSS asked both teachers and students to characterize their perceptions of safety in their schools. More specifically, teachers were asked how much they agreed with three statements:

- This school is located in a safe neighborhood;
- I feel safe at this school;
- This school's security policies and practices are sufficient.

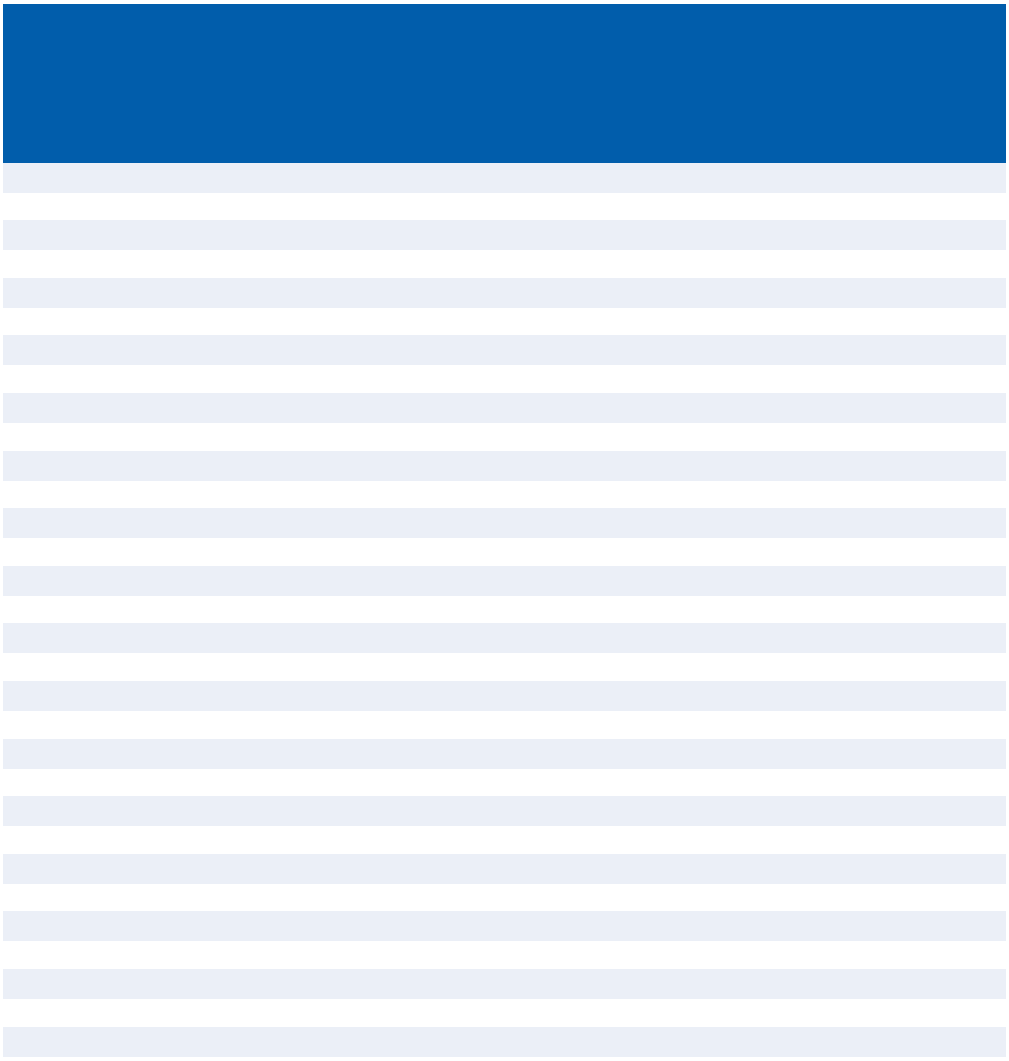
TIMSS used the teachers' responses to create an index, called the Index of Mathematics Teachers' Perceptions of Safety in the Schools. If their teachers agreed or agreed a lot to all three statements, then the students were placed in the high category. If their teachers disagreed or disagreed a lot to all three statements, then students were placed in the low category. All other combinations (some agreements and some disagreements) were placed in the medium category.

Exhibit 8.7 contains the results for the Index of Mathematics Teachers' Perception of Safety in the Schools. On the positive side

- I was made to do things that I didn't want to do by other students;
- I was made fun of or called names;
- I was left out of activities by other students.

TIMSS used students' responses to create the Index of Students' Perception of Being Safe in the Schools. Students who reported being

Exhibit 8.8 :



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