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## Exhibit R4.1 Shortages or Inadequacies in General Facilities and Materials That Affect Schools' Capacity to Provide Mathematics Instruction Some or A Lot

	Percentage of Students Affected by Shortage or Inadequacy				
	Instructional Materials	Budget for Supplies	School Buildings/ Grounds	Heating/Cooling and Lighting	Instructional Space
Australia	26 (3.7)	22 (4.1)	32 (4.1)	21 (3.5)	27 (4.0)
Belgium (Flemish)	6 (2.2)	5 (2.1)	20 (3.3)	4 (1.8)	20 (4.2)
Bulgaria	92 (2.2)	80 (5.8)	71 (4.3)	72 (4.1)	63 (5.0)
Canada	45 (2.8)	43 (2.8)	29 (2.8)	11 (1.9)	25 (2.4)
Chile	23 (3.1)	34 (3.0)	38 (3.6)	22 (2.9)	31 (3.8)
Chinese Taipei	45 (4.4)	45 (4.0)	59 (4.1)	41 (3.9)	51 (4.0)
Cyprus	7 (0.1)	7 (0.1)	61 (0.2)	30 (0.3)	45 (0.3)
Czech Republic	22 (5.0)	52 (5.5)	15 (3.3)	5 (1.4)	11 (3.3)
England	r 37 (4.9)	r 31 (4.5)	r 42 (5.3)	r 17 (3.6)	r 38 (5.1)
Finland	31 (4.0)	10 (2.8)	49 (4.1)	16 (3.6)	41 (3.7)
Hong Kong, SAR	35 (3.9)	21 (3.9)	57 (4.8)	24 (3.4)	57 (4.6)
Hungary	27 (3.9)	25 (3.7)	32 (3.8)	17 (3.4)	39 (4.2)
Indonesia	45 (4.4)	36 (4.3)	39 (4.1)	36 (4.6)	44 (3.9)
Iran, Islamic Rep.	26 (4.0)	61 (3.7)	68 (4.0)	50 (4.7)	54 (3.9)
Israel	15 (3.1)	18 (3.3)	42 (4.5)	28 (3.8)	33 (4.4)
Italy	28 (3.5)	28 (3.6)	31 (3.7)	15 (2.7)	35 (3.4)
Japan	17 (2.9)	14 (3.0)	29 (3.8)	31 (3.5)	34 (3.5)
Jordan	74 (4.1)	64 (4.3)	75 (3.9)	74 (3.7)	69 (3.7)
Korea, Rep. of	37 (3.9)	29 (4.0)	51 (4.5)	52 (4.2)	55 (4.2)
Latvia (LSS)	80 (3.8)	87 (3.3)	72 (4.0)	65 (4.9)	65 (4.2)
Lithuania <sup>‡</sup>	82 (3.3)	65 (3.9)	31 (4.0)	45 (4.1)	56 (3.8)
Macedonia, Rep. of	38 (4.3)	75 (3.8)	74 (3.7)	52 (4.2)	63 (4.4)
Malaysia	38 (4.3)	44 (4.2)	40 (4.6)	26 (3.4)	40 (4.2)
Moldova	97 (0.9)	95 (1.8)	77 (3.9)	91 (2.4)	69 (4.0)
Morocco	59 (4.0)	77 (3.4)	58 (4.3)	45 (4.1)	45 (4.0)
Netherlands	r 10 (4.0)	r 19 (6.4)	r 45 (7.0)	r 9 (2.8)	r 26 (5.3)
New Zealand	24 (3.6)	27 (3.5)	37 (4.2)	6 (2.1)	29 (3.9)
Philippines	67 (4.0)	52 (4.4)	56 (3.9)	49 (3.9)	52 (4.3)
Romania	54 (4.6)	74 (3.8)	50 (4.8)	36 (4.1)	46 (4.3)
Russian Federation	92 (2.4)	81 (3.1)	73 (3.6)	63 (4.4)	69 (3.2)
Singapore	10 (2.2)	7 (2.0)	23 (2.6)	11 (2.4)	26 (3.3)
Slovak Republic	44 (4.4)	67 (4.0)	31 (4.6)	12 (2.9)	42 (5.0)
Slovenia	55 (4.2)	68 (4.0)	60 (4.5)	49 (4.3)	62 (4.2)
South Africa	67 (4.1)	66 (4.1)	61 (4.3)	59 (4.1)	57 (3.7)
Thailand	86 (3.0)	84 (2.9)	81 (3.2)	63 (4.1)	78 (3.1)
Tunisia	83 (3.2)	77 (3.5)	87 (2.8)	48 (4.5)	76 (3.7)
Turkey	80 (3.6)	60 (4.0)	78 (3.6)	74 (3.5)	75 (4.0)
United States	r 22 (2.9)	r 27 (4.1)	r 33 (3.4)	r 17 (3.5)	r 33 (3.4)
<b>International Avg.</b>	45 (0.6)	47 (0.6)	50 (0.7)	36 (0.6)	47 (0.6)

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

Background data provided by schools.

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

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

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

## Shortages or Inadequacies in Equipment and Materials for Mathematics Instruction That Affect Schools' Capacity to Provide Instruction in Mathematics Some or A Lot

	Percentage of Students Affected by Shortage or Inadequacy				
	Computers for Mathematics Instruction	Computer Software for Mathematics Instruction	Calculators for Mathematics Instruction	Library Materials Relevant to Mathematics Instruction	Audio-Visual Resources for Mathematics Instruction
Australia	49 (4.7)	50 (4.7)	11 (2.7)	20 (3.4)	22 (3.9)
Belgium (Flemish)	30 (3.3)	25 (3.4)	2 (1.1)	15 (3.0)	19 (3.0)
Bulgaria	86 (3.0)	80 (3.5)	53 (5.0)	78 (3.6)	72 (4.2)
Canada	47 (2.9)	59 (2.7)	26 (3.0)	34 (3.7)	34 (3.4)
Chile	46 (3.6)	50 (3.7)	35 (3.5)	47 (3.4)	49 (3.9)
Chinese Taipei	57 (4.3)	66 (4.2)	47 (4.7)	56 (4.4)	63 (4.2)
Cyprus	54 (0.2)	r 45 (0.3)	12 (0.2)	21 (0.2)	30 (0.2)
Czech Republic	37 (4.0)	33 (4.0)	8 (3.0)	16 (3.8)	14 (3.5)
England	r 51 (5.2)	r 53 (5.0)	r 23 (3.8)	r 29 (4.5)	r 30 (4.5)
Finland	49 (4.1)	54 (3.9)	13 (3.2)	14 (3.2)	19 (3.8)
Hong Kong, SAR	61 (4.8)	70 (4.2)	16 (3.1)	32 (3.4)	45 (4.5)
Hungary	49 (4.5)	54 (4.7)	22 (3.4)	18 (3.4)	31 (4.0)
Indonesia	37 (4.8)	37 (4.7)	38 (4.6)	52 (4.8)	43 (4.8)
Iran, Islamic Rep.	71 (4.4)	73 (4.2)	63 (4.2)	75 (3.6)	69 (4.7)
Israel	45 (5.0)	47 (4.2)	25 (4.1)	41 (4.2)	45 (4.3)
Italy	38 (3.8)	50 (3.7)	18 (3.3)	32 (3.8)	42 (3.6)
Japan	33 (4.2)	42 (4.2)	7 (2.2)	12 (2.8)	25 (3.9)
Jordan	63 (4.3)	61 (4.3)	42 (4.5)	59 (4.6)	67 (4.5)
Korea, Rep. of	64 (4.0)	71 (3.8)	42 (3.9)	58 (4.5)	70 (4.0)
Latvia (LSS)	73 (4.3)	73 (4.4)	37 (4.4)	67 (3.9)	69 (4.7)
Lithuania <sup>‡</sup>	76 (3.7)	79 (3.6)	45 (4.2)	56 (4.0)	72 (3.9)
Macedonia, Rep. of	88 (2.9)	90 (2.5)	84 (3.1)	88 (2.7)	90 (2.5)
Malaysia	40 (4.4)	42 (4.6)	29 (3.6)	47 (4.0)	48 (4.2)
Moldova	81 (3.2)	79 (3.6)	78 (3.5)	90 (1.9)	90 (2.4)
Morocco	54 (4.8)	54 (4.8)	55 (4.8)	62 (4.4)	67 (4.8)
Netherlands	r 46 (6.8)	r 50 (6.6)	r 2 (1.2)	r 18 (5.0)	r 18 (4.3)
New Zealand	47 (4.2)	47 (4.3)	21 (3.4)	20 (3.6)	26 (3.6)
Philippines	57 (3.8)	58 (3.8)	54 (3.8)	66 (3.8)	65 (3.9)
Romania	85 (3.3)	83 (3.5)	69 (4.1)	68 (4.3)	69 (4.4)
Russian Federation	89 (2.2)	87 (2.9)	69 (4.3)	71 (3.8)	82 (3.5)
Singapore	30 (4.2)	44 (4.8)	5 (1.8)	13 (2.8)	17 (3.4)
Slovak Republic	85 (3.3)	87 (2.9)	35 (4.8)	41 (5.0)	60 (3.8)
Slovenia	51 (4.2)	50 (4.3)	18 (3.4)	39 (3.6)	42 (4.0)
South Africa	76 (3.2)	74 (3.6)	67 (4.1)	74 (3.5)	75 (3.9)
Thailand	74 (3.8)	75 (3.7)	54 (3.8)	88 (3.0)	88 (3.0)
Tunisia	38 (4.0)	39 (4.1)	34 (4.1)	40 (4.2)	42 (4.2)
Turkey	67 (4.1)	68 (4.0)	37 (3.7)	78 (3.3)	79 (3.9)
United States	r 47 (4.2)	r 48 (4.1)	r 16 (3.4)	r 29 (4.0)	r 25 (3.2)
<b>International Avg.</b>	57 (0.7)	59 (0.7)	35 (0.6)	46 (0.6)	50 (0.6)

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

Background data provided by schools.

<sup>‡</sup> 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.

	Percentage of Students by Number of Students per Computer <sup>1</sup>				Percentage of Students in Schools Without Any Computers
	Fewer than 15 Students per Computer	15-30 Students per Computer	31-50 Students per Computer	More than 50 Students per Computer	
Australia r	100 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Belgium (Flemish) r	83 (3.0)	9 (2.2)	1 (0.8)	4 (1.7)	4 (1.6)
Bulgaria	48 (5.9)	9 (2.3)	4 (1.5)	2 (1.1)	37 (5.3)
Canada	100 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Chile	70 (2.8)	6 (1.9)	2 (1.1)	4 (1.0)	18 (3.0)
Chinese Taipei	90 (2.5)	9 (2.6)	1 (0.8)	0 (0.0)	0 (0.0)
Cyprus	6 (0.1)	9 (0.1)	16 (0.1)	48 (0.2)	22 (0.2)
Czech Republic	89 (3.0)	2 (1.4)	5 (2.4)	0 (0.0)	3 (1.2)
England r	100 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Finland	98 (1.2)	1 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)
Hong Kong, SAR r	86 (3.3)	3 (1.5)	4 (1.8)	3 (1.3)	5 (2.2)
Hungary	98 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.1)
Indonesia	6 (1.4)	12 (3.6)	3 (1.0)	22 (4.4)	57 (4.5)
Iran, Islamic Rep.	1 (1.1)	1 (0.6)	1 (0.7)	5 (1.7)	92 (2.1)
Israel s	92 (2.8)	4 (2.4)	1 (0.0)	0 (0.0)	3 (1.7)
Italy	64 (3.4)	19 (2.9)	7 (2.2)	3 (1.3)	6 (1.6)
Japan	92 (2.7)	5 (1.8)	0 (0.0)	0 (0.0)	3 (1.9)
Jordan	44 (3.4)	9 (2.5)	1 (0.0)	1 (0.8)	45 (3.7)
Korea, Rep. of	75 (3.6)	14 (3.2)	6 (1.8)	5 (1.8)	1 (0.0)
Latvia (LSS) r	88 (3.0)	2 (1.7)	1 (1.1)	1 (0.1)	7 (2.3)
Lithuania †	81 (3.2)	8 (2.4)	1 (0.9)	1 (1.0)	8 (2.2)
Macedonia, Rep. of	20 (2.8)	26 (3.6)	5 (2.1)	3 (1.6)	45 (3.8)
Malaysia	6 (2.2)	10 (2.2)	7 (2.0)	26 (3.6)	50 (4.0)
Moldova	81 (3.6)	6 (2.0)	0 (0.0)	0 (0.0)	13 (3.0)
Morocco	3 (1.4)	4 (1.5)	8 (2.2)	16 (2.8)	68 (3.6)
Netherlands s	99 (1.0)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
New Zealand	99 (0.6)	0 (0.0)	0 (0.0)	1 (0.0)	0 (0.0)
Philippines	14 (2.2)	8 (2.2)	6 (2.0)	31 (3.9)	42 (4.2)
Romania	14 (3.2)	13 (2.9)	2 (1.2)	5 (1.8)	65 (4.3)
Russian Federation	37 (4.9)	6 (2.0)	1 (0.0)	3 (1.5)	53 (4.8)
Singapore	98 (1.3)	2 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)
Slovak Republic	21 (3.9)	10 (3.0)	4 (2.0)	4 (1.9)	61 (4.7)
Slovenia	95 (1.9)	3 (1.6)	0 (0.0)	1 (0.9)	1 (0.0)
South Africa	18 (2.9)	4 (1.6)	2 (0.9)	5 (1.5)	72 (3.0)
Thailand	58 (4.3)	16 (2.9)	5 (1.8)	10 (2.7)	11 (2.7)
Tunisia	0 (0.0)	0 (0.0)	1 (0.7)	6 (2.2)	93 (2.3)
Turkey s	21 (4.1)	2 (1.1)	2 (1.1)	2 (1.3)	73 (4.1)
United States s	97 (1.8)	3 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)
<b>International Avg.</b>	60 (0.4)	6 (0.3)	3 (0.2)	6 (0.3)	25 (0.4)

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

Background data provided by schools.

<sup>1</sup> Ratio of grade 8 enrollment to total computers for instructional use by grade 8 teachers and 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.

Australia	r			
Belgium (Flemish)				
Bulgaria				
Canada				
Chile				
Chinese Taipei				
Cyprus	r			
Czech Republic				
England	r			
Finland				
Hong Kong, SAR	r			
Hungary				
Indonesia				
Iran, Islamic Rep.				
Israel	r			
Italy				
Japan				
Jordan				
Korea, Rep. of				
Latvia (LSS)	r			
Lithuania †				
Macedonia, Rep. of				
Malaysia				
Moldova				

