

**Chapter**

INTERNATIONAL STUDENT ACHIEVEMENT

## OVERALL DIFFERENCES IN ACHIEVEMENT ON THE PERFORMANCE ASSESSMENT

This chapter presents summary results on the performance assessment by showing the averages across the task-by-task results for each country, as well as the averages by subject area and by gender. Table 2.1 summarizes the results for the eighth grade, showing the overall average across tasks for each country as well as the average percentage scores across the items within each task. The average percentage scores for each task are the same as those presented in Chapter 1, accumulated here for ease of reference and comparison. The overall average of the average percentage scores across the tasks reflects equal weighting for each task, even though the number of items within the tasks varied.

The overall averages, shown in the first column of Table 2.1, reveal substantial differences in overall performance between the top- and bottom-performing countries, although most countries performed somewhere in the middle ranges. Also, for the most part, differences in performance between one country and the next higher- and lower-performing countries were relatively small. This pattern of results is similar to that obtained in the written assessment. The relative standing of countries was somewhat similar between the written assessment and the performance assessment, even though relative standings shifted for many countries in the middle range of performance.<sup>1</sup>

Perhaps more important, as shown by the international averages in the bottom row of the Table 2.1, the results also show considerable variation in the difficulty of the tasks. Across countries, the Magnets task was the least difficult (international average 90%) and the Shadows task the most difficult (international average 35%). Because of this wide range in difficulty, the performance assessment results are most useful from the perspective of profiling the strengths and weaknesses of each country on particular tasks rather than simply looking at the overall average. This profiling, however, should be done with care, because the difficult tasks tended to be relatively difficult for students in all countries, and so the international averages for the tasks should be taken into account. Also, because countries that did well overall generally also did relatively better than other countries on each of the tasks, the profiling should be done in view of a country's overall performance. As an example, Sweden performed just slightly above the international average overall, but did particularly well on the Shadows, Plasticine, Folding and Cutting, and Around the Bend tasks compared with the international averages for those tasks.

Table 2.2 presents the corresponding overall and task achievement for the countries participating at the fourth grade. Here, with a smaller set of countries, the range in task difficulty was much larger than the differences in overall performance across countries. At the fourth grade, the Magnets task was the least difficult (international average 72%) and the Packaging task was the most difficult (international average 17%).

<sup>1</sup> Beaton, A.E., Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., Kelly, D.L., and Smith, T.A. (1996). *Mathematics Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study (TIMSS)*. Chestnut Hill, MA: Boston College.

Beaton, A.E., Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., Smith, T.A., and Kelly, D.L. (1996). *Science Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study (TIMSS)*. Chestnut Hill, MA: Boston College.

Tables 2.3 and 2.4 display overall averages separately for the mathematics and science tasks for the eighth and fourth grades, respectively.<sup>2</sup> Interestingly, at the eighth grade the international averages for the two subject areas are nearly identical, reflecting nearly equal difficulty levels for the two sets of tasks. The pattern of similar results for the two areas also held for most countries.

As previously explained, with the exception of the Magnets, Batteries, Dice, and Packaging tasks, the items in the fourth-grade tasks differed somewhat from those in the counterpart eighth-grade tasks. At the fourth grade, the science tasks were somewhat less difficult overall than the mathematics tasks (international average 43% compared with 36%). This pattern was reflected in the performance of all countries except Iran. It is likely that the fourth-grade science tasks were simply easier than the mathematics tasks, because as the teachers of the fourth graders in most of the TIMSS countries, including the countries that participated in the performance assessment, reported, students received more instructional time in mathematics than in science (sometimes more than twice as much). From another perspective, however, it may be that in elementary school “hands-on” approaches are more likely to be used in science than in mathematics.

<sup>2</sup> For the purposes of analyzing performance in science and mathematics, the two combination tasks were included in only one primary content area average. The Shadows task was included in the science average, and the Plasticine task was included in the mathematics average.

**Table 2.1** Average Percentage Scores Overall and on Performance Assessment Tasks Eighth Grade\*

Country	Overall Average <sup>†</sup>	Average Percentage Scores on Tasks <sup>•</sup>											
		Science Tasks					Combination Tasks		Mathematics Tasks				
		Pulse	Magnets	Batteries	Rubber Band	Solutions	Shadows	Plasticine	Dice	Calculator	Folding and Cutting	Around Bend	Packaging
Singapore	71 (1.7)	60 (2.7)	95 (0.9)	79 (2.1)	80 (1.5)	68 (2.7)	50 (3.5)	66 (3.3)	84 (1.6)	60 (2.8)	80 (2.6)	63 (1.5)	65 (2.5)
<sup>††</sup> Switzerland	65 (1.2)	51 (1.9)	97 (1.2)	75 (2.1)	67 (1.9)	57 (1.9)	41 (2.1)	73 (2.1)	79 (1.4)	61 (1.6)	79 (1.9)	54 (2.2)	47 (3.3)
Sweden	64 (1.2)	45 (2.6)	95 (1.6)	71 (2.9)	70 (2.4)	50 (2.2)	45 (1.9)	72 (2.9)	74 (2.4)	51 (2.3)	80 (2.5)	65 (1.9)	47 (2.3)
<sup>†</sup> Scotland	62 (1.7)	55 (2.9)	98 (0.9)	68 (2.4)	75 (1.8)	51 (2.3)	36 (2.4)	61 (2.5)	76 (1.6)	49 (3.1)	71 (3.9)	58 (2.1)	51 (3.9)
Norway	62 (0.8)	48 (1.6)	91 (2.0)	67 (1.7)	63 (1.9)	42 (1.8)	39 (2.0)	67 (2.3)	72 (1.9)	59 (1.6)	73 (2.1)	62 (1.3)	59 (2.4)
Czech Republic	61 (1.3)	46 (2.9)	86 (2.3)	66 (2.8)	65 (3.6)	59 (2.3)	37 (1.9)	68 (2.6)	73 (2.5)	54 (2.0)	73 (3.2)	58 (1.5)	43 (4.6)
Canada	60 (1.3)	46 (2.4)	92 (1.5)	62 (2.1)	71 (2.0)	48 (2.1)	35 (1.6)	65 (1.9)	77 (1.8)	60 (1.5)	59 (2.5)	53 (2.0)	57 (3.2)
New Zealand	60 (1.4)	44 (2.1)	93 (1.6)	68 (1.6)	65 (1.8)	48 (2.1)	29 (2.0)	63 (2.2)	73 (1.2)	55 (1.6)	75 (2.3)	60 (1.4)	44 (2.5)
Spain	54 (0.8)	36 (2.1)	96 (1.4)	73 (1.7)	51 (2.0)	41 (2.3)	36 (1.7)	45 (2.5)	73 (2.2)	53 (2.1)	61 (3.1)	53 (1.9)	28 (2.3)
Iran, Islamic Rep.	52 (2.0)	55 (4.5)	45 (4.9)	52 (4.0)	56 (5.4)	50 (3.5)	43 (1.5)	81 (2.6)	58 (1.8)	48 (3.7)	58 (2.9)	34 (3.2)	43 (5.0)
Portugal	47 (1.1)	24 (2.5)	94 (1.6)	50 (2.2)	51 (2.3)	36 (2.4)	25 (1.5)	41 (2.5)	76 (1.8)	39 (2.1)	58 (3.1)	43 (1.8)	31 (3.2)
Cyprus	46 (1.0)	33 (2.1)	86 (2.3)	66 (2.2)	59 (2.3)	29 (2.9)	18 (1.5)	52 (2.4)	68 (2.2)	40 (1.9)	48 (2.4)	42 (1.5)	14 (2.1)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>													
Australia	65 (1.2)	54 (2.6)	92 (1.4)	71 (1.8)	64 (2.4)	59 (2.2)	36 (1.9)	73 (2.9)	78 (2.4)	59 (1.9)	74 (3.3)	58 (1.8)	55 (2.8)
<sup>2</sup> England	67 (0.9)	59 (2.2)	99 (0.6)	77 (2.0)	79 (1.4)	68 (2.1)	46 (2.3)	55 (2.4)	79 (1.6)	62 (1.4)	69 (3.1)	63 (1.5)	53 (2.5)
Netherlands	60 (1.3)	45 (2.6)	94 (2.1)	63 (2.9)	70 (1.9)	43 (2.7)	35 (2.8)	44 (2.5)	76 (2.2)	59 (2.3)	71 (2.4)	67 (1.9)	53 (2.9)
United States	55 (1.3)	50 (2.0)	85 (2.5)	56 (1.9)	63 (2.4)	48 (2.2)	28 (1.9)	53 (2.1)	71 (2.1)	56 (1.9)	68 (2.0)	48 (1.8)	28 (2.5)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>													
Colombia	39 (1.8)	11 (1.0)	96 (1.3)	55 (2.2)	40 (3.7)	26 (2.3)	22 (2.5)	41 (2.7)	49 (4.0)	31 (1.6)	43 (5.7)	34 (4.4)	20 (3.0)
<sup>3</sup> Romania	62 (1.9)	41 (3.6)	83 (3.5)	75 (2.2)	45 (3.0)	63 (2.6)	36 (2.8)	63 (4.1)	76 (2.3)	66 (2.6)	84 (2.3)	58 (3.1)	51 (4.1)
Slovenia	61 (1.0)	40 (3.2)	92 (1.9)	71 (1.8)	64 (1.7)	49 (2.0)	31 (1.8)	63 (1.9)	78 (1.4)	58 (1.5)	82 (2.0)	55 (1.9)	45 (3.8)
<b>International Average</b>	<b>59 (0.3)</b>	<b>44 (0.6)</b>	<b>90 (0.5)</b>	<b>67 (0.5)</b>	<b>63 (0.6)</b>	<b>49 (0.5)</b>	<b>35 (0.5)</b>	<b>60 (0.6)</b>	<b>73 (0.5)</b>	<b>54 (0.5)</b>	<b>69 (0.7)</b>	<b>54 (0.5)</b>	<b>44 (0.7)</b>

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

\* Eighth grade in most countries; see Table 2 for information about the grades tested in each country.

• Average of percentage scores across items in task; all items weighted equally (see overall task averages in Chapter 1).

† Average of percentage scores across tasks; all tasks weighted equally.

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details)

<sup>1</sup> National Desired Population does not cover all of International Desired Population (see Table A.2) - German-speaking cantons only.

<sup>2</sup> National Defined Population covers less than 90 percent of National Desired Population for the main assessment (see Table A.2).

<sup>3</sup> School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.2).

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

## Average Percentage Scores Overall and on Performance Assessment Tasks Fourth Grade\*

Table 2.2

Country	Overall Average <sup>▼</sup>	Average Percentage Scores on Tasks <sup>●</sup>											
		Science Tasks					Combination Tasks		Mathematics Tasks				
		Pulse	Magnets	Batteries	Rubber Band	Containers	Shadows	Plasticine	Dice	Calculator	Folding and Cutting	Around Bend	Packaging
Canada	45 (1.3)	36 (1.5)	84 (2.3)	48 (2.0)	55 (1.4)	40 (1.1)	36 (1.7)	43 (1.7)	46 (2.8)	47 (2.0)	31 (3.6)	49 (2.3)	27 (2.2)
<sup>††</sup> New Zealand	38 (1.2)	27 (2.1)	84 (2.2)	37 (1.4)	44 (2.3)	33 (1.4)	34 (1.0)	35 (2.0)	39 (2.3)	40 (1.7)	25 (3.8)	49 (2.8)	14 (2.2)
Iran, Islamic Rep.	38 (2.4)	41 (3.3)	42 (5.1)	40 (3.2)	36 (3.3)	30 (3.5)	26 (2.1)	63 (3.3)	34 (2.9)	35 (2.9)	50 (6.9)	28 (3.6)	34 (5.2)
Cyprus	34 (1.4)	38 (3.0)	68 (3.9)	41 (2.2)	45 (3.2)	42 (1.3)	16 (1.6)	30 (2.1)	39 (2.4)	31 (2.5)	28 (3.4)	25 (2.1)	4 (1.3)
Portugal	30 (1.4)	22 (1.8)	74 (3.1)	31 (2.5)	27 (2.2)	26 (1.9)	27 (1.6)	24 (2.3)	28 (2.6)	33 (2.0)	21 (3.1)	38 (3.3)	8 (1.8)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>													
Australia	44 (0.9)	38 (2.3)	77 (3.2)	40 (1.9)	52 (2.9)	39 (0.8)	33 (1.6)	40 (2.1)	54 (1.8)	43 (2.5)	40 (3.6)	51 (4.1)	24 (2.0)
Hong Kong	42 (1.4)	39 (2.1)	74 (3.8)	42 (2.0)	43 (2.5)	41 (1.3)	30 (1.6)	23 (1.7)	48 (3.8)	50 (2.5)	40 (4.0)	57 (2.5)	15 (2.4)
United States	41 (0.9)	42 (1.7)	73 (3.0)	38 (2.2)	45 (1.8)	40 (1.1)	33 (1.2)	31 (1.5)	45 (2.4)	42 (2.2)	44 (2.5)	42 (2.9)	13 (1.7)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>													
Slovenia	46 (1.3)	39 (2.7)	74 (3.8)	54 (2.0)	51 (1.7)	38 (1.3)	32 (1.8)	46 (2.7)	44 (2.5)	37 (1.9)	63 (3.6)	57 (2.7)	18 (2.4)
<b>International Average</b>	40 (0.5)	36 (0.8)	72 (1.2)	41 (0.7)	44 (0.8)	37 (0.6)	30 (0.5)	37 (0.7)	42 (0.9)	40 (0.8)	38 (1.3)	44 (1.0)	17 (0.9)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

\* Fourth grade in most countries; see Table 2 for information about the grades tested in each country.

● Average of percentage scores across items in task; all items weighted equally (see overall task averages in Chapter 1).

▼ Average of percentage scores across tasks; all tasks weighted equally.

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details).

†† School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.3).

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

**Table 2.3** Average Percentage Scores Overall and by Science and Mathematics Subject Areas Eighth Grade\*

Country	Overall Average <sup>▼</sup>	Average Percentage Scores by Subject Area <sup>●</sup>	
		Science Tasks	Mathematics Tasks
Singapore	71 (1.7)	72 (1.8)	70 (1.7)
<sup>††</sup> Switzerland	65 (1.2)	65 (1.0)	66 (1.5)
Sweden	64 (1.2)	63 (1.5)	65 (1.3)
<sup>†</sup> Scotland	62 (1.7)	64 (1.5)	61 (2.2)
Norway	62 (0.8)	58 (0.8)	65 (1.1)
Czech Republic	61 (1.3)	60 (1.3)	62 (1.7)
Canada	60 (1.3)	59 (1.3)	62 (1.4)
New Zealand	60 (1.4)	58 (1.5)	62 (1.3)
Spain	54 (0.8)	56 (1.0)	52 (1.1)
Iran, Islamic Rep.	52 (2.0)	50 (2.8)	54 (1.7)
Portugal	47 (1.1)	47 (1.2)	48 (1.3)
Cyprus	46 (1.0)	49 (1.0)	44 (1.2)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>			
Australia	65 (1.2)	63 (1.1)	66 (1.5)
<sup>2</sup> England	67 (0.9)	71 (0.9)	64 (1.0)
Netherlands	60 (1.3)	58 (1.4)	62 (1.5)
United States	55 (1.3)	55 (1.4)	54 (1.4)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>			
Colombia	39 (1.8)	42 (1.4)	37 (2.5)
<sup>3</sup> Romania	62 (1.9)	57 (2.0)	66 (2.0)
Slovenia	61 (1.0)	58 (1.1)	64 (1.0)
<b>International Average</b>	59 (0.3)	58 (0.3)	59 (0.4)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

\* Eighth grade in most countries; see Table 2 for information about the grades tested in each country.

● Average of percentage scores across tasks classified by primary science or mathematics subject area (see Table 2.1). Combination tasks were each included in only one content area average: Shadows in science average; Plasticine in mathematics average.

▼ Average of percentage scores across tasks; all tasks weighted equally.

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details)

<sup>1</sup> National Desired Population does not cover all of International Desired Population (see Table A.2) - German-speaking cantons only.

<sup>2</sup> National Defined Population covers less than 90 percent of National Desired Population for the main assessment (see Table A.2).

<sup>3</sup> School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.2).

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

## Average Percentage Scores Overall and by Science and Mathematics Subject Areas Fourth Grade\*

Table 2.4

Countries	Overall Average <sup>▼</sup>	Average Percentage Scores by Subject Area <sup>•</sup>	
		Science Tasks	Mathematics Tasks
Canada	45 (1.3)	50 (1.1)	40 (1.7)
<sup>††</sup> New Zealand	38 (1.2)	43 (1.1)	34 (1.5)
Iran, Islamic Rep.	38 (2.4)	36 (2.0)	40 (3.1)
Cyprus	34 (1.4)	42 (1.7)	26 (1.4)
Portugal	30 (1.4)	34 (1.1)	25 (1.9)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>			
Australia	44 (0.9)	47 (0.8)	42 (1.4)
Hong Kong	42 (1.4)	45 (1.3)	39 (1.8)
United States	41 (0.9)	45 (0.9)	36 (1.2)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>			
Slovenia	46 (1.3)	48 (1.4)	44 (1.6)
<b>International Average</b>	40 (0.5)	43 (0.4)	36 (0.6)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

\* Fourth Grade in most countries; see Table 2 for information about the grades tested in each country.

• Average of percentage scores across tasks classified by primary science or mathematics subject area (see Table 2.2). Combination tasks were each included in only one content area average: Shadows in science average; Plasticine in mathematics average.

▼ Average of percentage scores across tasks; all tasks weighted equally.

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details).

<sup>††</sup> School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.3).

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





## GENDER DIFFERENCES IN PERFORMANCE ASSESSMENT ACHIEVEMENT

Tables 2.5 and 2.6 show the overall averages and the percentage scores for each task by gender. At both grades for nearly all the countries, girls and boys had approximately the same average achievement both overall and on the individual tasks.

At the eighth grade, there were no significant differences overall in any country, however there were a few significant gender differences noted on individual tasks. In Australia, girls had higher achievement than boys on the Solutions and Dice tasks. Eighth-grade boys in Romania did better than girls on the Around the Bend task, while Swedish girls did better than boys on the Packaging task.

This similarity in performance of the genders is in contrast to the gender difference favoring males at the eighth grade in the written assessment, which was especially prevalent across countries in science.<sup>3</sup> The main survey results for many countries showed eighth-grade boys outperforming girls in earth science, physics, and chemistry; whereas there was little evidence of gender difference

on the performance assessment. However, some of the countries that participated in the performance assessment were among those showing few gender differences in science achievement on the written test.

At the fourth grade, in the performance assessment there were no significant differences in overall achievement by gender and virtually none in performance by task. The only significant gender differences in task performance were in Australia, where girls had higher achievement on Plasticine, and in the United States, where boys had higher achievement on Shadows. For the younger students, however, the similar achievement between the genders is more consistent with the findings for the written assessment. For most countries, gender differences on the written assessment were small or essentially nonexistent in mathematics overall.<sup>4</sup> In science, the gender differences on the written assessment were much less pervasive than at the eighth grade.<sup>5</sup>

<sup>3</sup> Beaton, A.E., Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., Smith, T.A., and Kelly, D.L. (1996). *Science Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study (TIMSS)*. Chestnut Hill, MA: Boston College.

<sup>4</sup> Mullis, I.V.S., Martin, M.O., Beaton, A.E., Gonzalez, E.J., Kelly, D.L., and Smith, T.A. (1997). *Mathematics Achievement in the Primary School Years: IEA's Third International Mathematics and Science Study (TIMSS)*. Chestnut Hill, MA: Boston College.

<sup>5</sup> Martin, M.O., Mullis, I.V.S., Beaton, A.E., Gonzalez, E.J., Smith, T.A., and Kelly, D.L. (1997). *Science Achievement in the Primary School Years: IEA's Third International Mathematics and Science Study (TIMSS)*. Chestnut Hill, MA: Boston College.

**Table 2.5** Gender Differences in Average Percentage Scores Overall and on Performance Assessment Tasks - Eighth Grade\*

Country	Overall Average <sup>▼</sup>		Average Percentage Scores on Tasks <sup>•</sup>											
			Pulse		Magnets		Batteries		Rubber Bands		Solutions		Shadows	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Canada	61 (1.5)	61 (1.3)	45 (2.7)	46 (3.9)	93 (1.6)	91 (2.0)	62 (2.0)	63 (3.3)	69 (3.0)	72 (2.1)	47 (1.9)	52 (3.2)	37 (2.4)	33 (2.3)
Cyprus	47 (1.2)	47 (1.5)	32 (3.2)	35 (2.7)	87 (3.8)	85 (3.7)	71 (2.8)	62 (4.3)	59 (4.2)	61 (2.7)	28 (3.7)	31 (3.1)	19 (2.4)	18 (2.1)
Czech Republic	62 (2.2)	60 (1.2)	48 (4.1)	42 (3.2)	86 (3.4)	86 (2.8)	72 (2.4)	61 (4.5)	63 (4.6)	67 (3.7)	57 (4.9)	62 (4.4)	38 (2.1)	36 (2.8)
Iran, Islamic Rep.	54 (2.9)	50 (2.7)	58 (7.5)	52 (5.0)	51 (5.8)	40 (7.6)	50 (6.2)	54 (4.0)	54 (7.8)	57 (4.1)	48 (3.8)	52 (4.8)	43 (2.4)	43 (2.5)
New Zealand	58 (1.5)	61 (1.5)	40 (2.4)	48 (2.5)	93 (2.3)	93 (2.0)	66 (2.7)	69 (1.4)	65 (2.5)	66 (2.0)	48 (2.7)	49 (2.6)	27 (2.1)	30 (2.5)
Norway	62 (1.2)	61 (1.3)	52 (2.6)	45 (2.5)	93 (2.4)	89 (2.8)	70 (2.2)	65 (2.9)	61 (3.5)	65 (1.8)	39 (2.7)	44 (2.7)	42 (2.4)	37 (2.4)
Portugal	47 (0.9)	48 (1.7)	24 (3.2)	25 (3.4)	95 (1.8)	92 (3.2)	49 (2.4)	52 (4.0)	47 (2.7)	56 (2.9)	36 (2.3)	35 (4.2)	25 (2.5)	25 (1.5)
<sup>†</sup> Scotland	64 (1.8)	62 (2.0)	57 (4.5)	52 (2.9)	98 (1.2)	97 (1.2)	72 (2.7)	65 (3.5)	78 (1.5)	73 (2.8)	50 (3.0)	54 (2.4)	38 (2.8)	35 (3.7)
Singapore	70 (1.8)	72 (2.1)	57 (2.8)	63 (3.5)	94 (1.5)	96 (1.7)	81 (2.8)	78 (2.8)	78 (1.8)	83 (2.1)	70 (3.4)	66 (3.1)	47 (4.0)	54 (4.3)
Spain	55 (1.4)	53 (0.9)	34 (3.1)	38 (2.6)	98 (1.1)	95 (2.1)	72 (2.5)	74 (2.6)	49 (4.2)	53 (2.6)	43 (3.2)	40 (2.8)	38 (2.1)	35 (2.4)
Sweden	63 (1.4)	63 (1.6)	47 (3.0)	39 (3.7)	95 (1.8)	95 (2.8)	76 (2.3)	63 (4.4)	68 (3.4)	71 (3.1)	51 (2.7)	50 (3.3)	45 (2.8)	45 (3.1)
<sup>††</sup> Switzerland	66 (1.9)	64 (1.1)	53 (3.2)	49 (3.0)	98 (1.3)	96 (1.9)	79 (2.2)	70 (2.9)	67 (2.6)	67 (2.7)	57 (3.1)	58 (2.2)	43 (3.2)	40 (2.6)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>														
Australia	62 (1.4)	67 (1.2)	49 (3.7)	60 (2.6)	91 (3.3)	92 (2.6)	76 (2.4)	68 (3.5)	60 (3.2)	70 (3.4)	51 (2.3)	▲ 65 (2.6)	36 (3.3)	35 (2.8)
<sup>2</sup> England	67 (1.6)	68 (1.2)	58 (3.1)	60 (3.4)	99 (1.0)	99 (0.5)	77 (2.7)	77 (3.6)	78 (2.3)	81 (2.2)	64 (3.4)	71 (2.7)	45 (2.9)	47 (3.3)
Netherlands	61 (1.8)	60 (1.5)	49 (3.4)	41 (3.8)	92 (3.6)	97 (2.0)	68 (2.6)	59 (3.8)	68 (2.1)	72 (2.6)	47 (4.0)	40 (2.7)	37 (5.3)	33 (2.5)
United States	54 (1.4)	56 (1.5)	50 (3.0)	50 (2.5)	86 (3.2)	84 (3.2)	54 (2.8)	59 (2.7)	62 (2.5)	64 (3.5)	44 (3.0)	52 (2.7)	29 (2.5)	27 (2.3)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>														
Colombia	39 (3.4)	38 (1.6)	12 (1.5)	11 (1.6)	96 (1.4)	95 (1.9)	52 (4.3)	58 (2.8)	36 (5.8)	44 (2.6)	26 (5.4)	26 (2.5)	26 (3.5)	18 (2.8)
<sup>3</sup> Romania	62 (2.1)	61 (1.9)	42 (3.9)	40 (4.0)	83 (4.7)	83 (4.5)	76 (2.7)	74 (3.0)	39 (3.0)	49 (3.6)	60 (3.2)	65 (2.9)	39 (3.7)	32 (3.4)
Slovenia	62 (1.2)	59 (1.6)	37 (4.5)	39 (5.1)	95 (2.9)	90 (3.3)	72 (3.0)	70 (3.1)	67 (2.7)	61 (2.4)	49 (3.3)	52 (3.8)	34 (3.8)	29 (2.3)
<b>International Average</b>	<b>59 (0.4)</b>	<b>58 (0.4)</b>	<b>44 (0.8)</b>	<b>44 (0.8)</b>	<b>91 (0.7)</b>	<b>89 (0.7)</b>	<b>68 (0.7)</b>	<b>65 (0.8)</b>	<b>61 (0.8)</b>	<b>▲ 65 (0.7)</b>	<b>48 (0.8)</b>	<b>51 (0.7)</b>	<b>36 (0.7)</b>	<b>34 (0.6)</b>

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

▲ = Difference from other gender statistically significant at .05 level, adjusted for multiple comparisons across each row

\* Eighth grade in most countries; see Table 2 for information about the grades tested in each country.

• Average of percentage scores across items in task: all items weighted equally (see overall task averages in Chapter 1).

▼ Average of percentage scores across tasks; all tasks weighted equally.

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details)

<sup>1</sup> National Desired Population does not cover all of International Desired Population (see Table A.2) - German-speaking cantons only.

<sup>2</sup> National Defined Population covers less than 90 percent of National Desired Population for the main assessment (see Table A.2).

<sup>3</sup> School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.2).

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

## Gender Differences in Average Percentage Scores Overall and on Performance Assessment Tasks - Eighth Grade\* (Continued)

### Table 2.5

Country	Average Percentage Scores on Tasks <sup>•</sup>											
	Plasticine		Dice		Calculator		Folding and Cutting		Around Bend		Packaging	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Canada	64 (2.5)	65 (1.9)	77 (2.2)	77 (2.5)	59 (2.2)	61 (1.5)	60 (3.0)	58 (3.6)	55 (2.9)	52 (2.1)	60 (4.1)	56 (3.3)
Cyprus	56 (4.0)	48 (3.6)	67 (3.9)	70 (3.0)	42 (3.2)	40 (2.8)	43 (2.9)	55 (4.2)	43 (2.4)	40 (3.1)	13 (2.2)	15 (3.8)
Czech Republic	69 (4.5)	68 (3.2)	71 (3.5)	77 (3.4)	57 (3.6)	52 (3.0)	73 (3.6)	73 (4.2)	57 (2.4)	60 (1.9)	53 (7.3)	35 (4.5)
Iran, Islamic Rep.	87 (2.6)	75 (4.1)	60 (2.2)	57 (3.1)	55 (4.2)	42 (5.4)	64 (2.5)	52 (4.1)	35 (5.4)	33 (2.3)	42 (8.3)	44 (4.0)
New Zealand	60 (3.3)	66 (3.1)	73 (1.7)	74 (2.0)	54 (2.5)	56 (2.0)	76 (3.1)	74 (2.4)	60 (1.7)	61 (1.4)	40 (3.0)	48 (3.5)
Norway	67 (3.0)	66 (3.3)	68 (2.3)	77 (2.5)	58 (2.8)	60 (2.2)	72 (4.2)	73 (3.1)	66 (2.3)	59 (1.8)	59 (3.2)	59 (4.1)
Portugal	41 (3.1)	39 (2.9)	74 (2.7)	79 (2.2)	38 (2.4)	42 (3.1)	61 (3.6)	55 (5.9)	45 (2.4)	41 (2.1)	31 (3.2)	31 (4.5)
<sup>†</sup> Scotland	62 (2.8)	62 (4.0)	77 (2.5)	75 (2.8)	50 (4.2)	48 (3.9)	72 (5.2)	74 (5.0)	62 (2.3)	56 (3.1)	54 (4.0)	49 (5.8)
Singapore	68 (3.6)	64 (4.5)	84 (2.3)	84 (2.1)	58 (3.1)	63 (4.1)	80 (3.5)	81 (3.2)	67 (1.4)	59 (2.6)	61 (2.9)	69 (3.9)
Spain	49 (2.7)	42 (3.2)	76 (3.1)	71 (3.3)	54 (2.9)	52 (2.9)	62 (5.1)	61 (2.7)	54 (3.1)	53 (1.8)	29 (3.2)	28 (2.9)
Sweden	72 (3.1)	70 (4.1)	71 (3.4)	76 (2.9)	49 (3.6)	51 (2.7)	83 (2.4)	74 (2.9)	65 (2.1)	67 (2.4)	40 (3.2)	▲ 54 (3.0)
<sup>††</sup> Switzerland	74 (2.8)	72 (3.0)	76 (2.4)	81 (1.5)	63 (3.3)	60 (1.8)	82 (3.2)	77 (3.4)	55 (3.5)	53 (2.3)	51 (5.8)	44 (3.9)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>												
Australia	69 (4.2)	76 (2.7)	72 (3.9)	▲ 85 (1.6)	56 (2.2)	62 (2.2)	73 (3.9)	74 (4.2)	60 (2.4)	57 (2.2)	51 (3.4)	59 (4.2)
<sup>2</sup> England	56 (2.6)	54 (4.0)	77 (2.9)	81 (1.5)	60 (2.2)	64 (2.6)	71 (3.6)	67 (4.0)	64 (2.2)	61 (2.0)	52 (4.2)	55 (2.9)
Netherlands	43 (4.6)	45 (2.7)	75 (3.6)	77 (1.8)	55 (3.0)	63 (3.4)	70 (5.0)	71 (2.7)	68 (2.7)	66 (2.4)	55 (4.7)	51 (3.5)
United States	51 (3.1)	55 (2.7)	70 (3.2)	73 (2.5)	55 (2.3)	56 (2.3)	67 (2.5)	70 (3.3)	50 (2.3)	46 (2.4)	24 (3.0)	31 (2.9)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>												
Colombia	43 (3.5)	40 (3.5)	46 (6.0)	53 (3.8)	32 (2.6)	28 (2.1)	45 (6.3)	40 (7.1)	34 (8.2)	31 (3.6)	24 (4.2)	18 (2.8)
<sup>3</sup> Romania	63 (5.0)	63 (4.5)	75 (2.8)	76 (2.9)	67 (3.5)	64 (2.9)	84 (2.5)	84 (3.3)	▲ 65 (2.8)	50 (4.0)	52 (6.1)	49 (3.6)
Slovenia	69 (2.2)	57 (3.5)	78 (2.1)	81 (1.8)	58 (2.3)	58 (2.6)	81 (3.5)	82 (2.9)	55 (3.3)	53 (3.0)	48 (4.9)	42 (3.9)
<b>International Average</b>	61 (0.8)	59 (0.8)	72 (0.7)	▲ 75 (0.6)	54 (0.7)	54 (0.7)	69 (0.9)	68 (0.9)	▲ 56 (0.8)	53 (0.6)	44 (1.0)	44 (0.9)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

▲ = Difference from other gender statistically significant at .05 level, adjusted for multiple comparisons across each row

\* Eighth grade in most countries; see Table 2 for information about the grades tested in each country.

▼ Average of percentage scores across tasks; all tasks weighted equally.

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details)

<sup>1</sup> National Desired Population does not cover all of International Desired Population (see Table A.2) - German-speaking cantons only.<sup>2</sup> National Defined Population covers less than 90 percent of National Desired Population for the main assessment (see Table A.2).<sup>3</sup> School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.2).

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

**Table 2.6**

**Gender Differences in Average Percentage Scores Overall and on Performance Assessment Tasks - Fourth Grade\***

Country	Overall Average <sup>†</sup>		Average Percentage Scores on Tasks <sup>•</sup>											
			Pulse		Magnets		Batteries		Rubber Bands		Containers		Shadows	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Canada	46 (1.6)	46 (1.3)	38 (2.4)	37 (2.0)	84 (3.0)	86 (3.1)	50 (2.1)	48 (3.3)	55 (2.3)	57 (1.8)	39 (1.9)	41 (1.8)	37 (2.5)	34 (2.3)
Cyprus	36 (1.6)	32 (1.5)	39 (3.2)	38 (3.8)	75 (4.0)	66 (7.1)	45 (3.3)	34 (3.2)	48 (4.3)	41 (3.8)	42 (1.9)	41 (1.8)	17 (2.8)	16 (1.6)
Iran, Islamic Rep.	37 (3.0)	39 (3.1)	39 (4.5)	43 (3.7)	37 (7.8)	46 (6.8)	41 (4.6)	39 (3.1)	41 (4.5)	31 (3.3)	32 (4.0)	27 (5.3)	24 (2.1)	27 (2.9)
<sup>††</sup> New Zealand	37 (1.3)	40 (1.4)	27 (2.6)	27 (2.7)	80 (3.1)	89 (3.0)	38 (1.6)	36 (2.3)	42 (2.7)	46 (3.0)	30 (1.7)	36 (1.8)	33 (1.7)	35 (1.7)
Portugal	31 (1.8)	29 (1.6)	27 (2.6)	18 (2.4)	72 (3.9)	75 (4.5)	36 (2.7)	29 (3.3)	31 (4.7)	23 (2.5)	25 (2.6)	27 (2.5)	25 (2.9)	28 (2.0)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>														
Australia	44 (1.3)	45 (1.2)	35 (3.4)	42 (2.0)	80 (3.3)	74 (4.6)	39 (2.3)	40 (3.1)	50 (3.8)	53 (3.2)	40 (1.4)	39 (2.0)	34 (1.5)	31 (3.2)
Hong Kong	42 (1.9)	42 (1.7)	42 (2.6)	34 (3.3)	74 (5.0)	73 (5.3)	45 (2.7)	39 (2.5)	43 (3.2)	43 (3.4)	41 (2.0)	41 (2.1)	31 (2.6)	28 (1.8)
United States	42 (1.3)	39 (0.9)	44 (2.3)	40 (2.0)	73 (3.7)	74 (3.4)	41 (3.2)	35 (2.7)	46 (2.6)	43 (2.4)	40 (1.5)	39 (1.3)	▲ 36 (1.7)	30 (1.1)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>														
Slovenia	44 (1.9)	47 (1.4)	36 (4.2)	39 (4.6)	72 (5.5)	75 (5.2)	56 (3.2)	52 (3.6)	50 (2.3)	50 (3.1)	39 (2.5)	38 (1.8)	34 (3.0)	34 (2.3)
<b>International Average</b>	40 (0.6)	40 (0.6)	36 (1.1)	35 (1.0)	72 (1.5)	73 (1.7)	▲ 43 (1.0)	39 (1.0)	45 (1.2)	43 (1.0)	37 (0.8)	37 (0.8)	30 (0.8)	29 (0.7)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

▲ = Difference from other gender statistically significant at .05 level, adjusted for multiple comparisons across each row

\* Fourth grade in most countries; see Table 2 for information about the grades tested in each country.

• Average of percentage scores across items in task; all items weighted equally (see overall task averages in Chapter 1).

† Average of percentage scores across tasks; all tasks weighted equally.

†† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details)

‡ School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.3).

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

# Gender Differences in Average Percentage Scores Overall and on Performance Assessment Tasks - Fourth Grade\* (Continued)

**Table 2.6**

Country	Average Percentage Scores on Tasks <sup>•</sup>											
	Plasticine		Dice		Calculator		Folding and Cutting		Around Bend		Packaging	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Canada	43 (2.5)	45 (2.0)	44 (2.9)	48 (3.7)	46 (2.8)	50 (2.3)	35 (4.4)	30 (4.1)	50 (2.9)	49 (2.9)	26 (2.0)	30 (3.3)
Cyprus	33 (2.4)	30 (2.6)	38 (3.4)	42 (5.3)	34 (3.1)	25 (2.5)	32 (5.0)	24 (4.1)	24 (3.0)	26 (1.8)	1 (0.7)	6 (2.4)
Iran, Islamic Rep.	65 (4.0)	60 (4.6)	27 (3.3)	41 (4.6)	35 (4.1)	35 (3.7)	41 (9.5)	59 (8.3)	25 (3.5)	30 (5.7)	35 (6.8)	33 (6.9)
<sup>††</sup> New Zealand	34 (2.3)	35 (2.9)	36 (3.8)	43 (2.7)	37 (2.5)	43 (1.7)	24 (4.6)	27 (4.9)	47 (3.9)	50 (3.3)	18 (3.1)	11 (2.0)
Portugal	26 (3.3)	22 (2.0)	31 (4.2)	25 (3.0)	30 (2.7)	36 (2.5)	17 (4.0)	23 (4.3)	42 (4.4)	34 (4.2)	9 (2.0)	7 (3.1)
<b>Countries Not Satisfying Guidelines for Sample Participation Rates (See Appendix A for Details):</b>												
Australia	33 (2.7)	▲ 49 (2.7)	51 (3.3)	55 (3.5)	43 (3.6)	43 (3.2)	42 (3.3)	37 (6.0)	52 (4.8)	51 (5.0)	23 (3.1)	25 (3.1)
Hong Kong	20 (2.5)	27 (2.3)	45 (4.7)	51 (5.5)	51 (4.9)	50 (2.5)	40 (6.6)	41 (5.6)	58 (3.5)	56 (3.0)	13 (2.7)	17 (3.6)
United States	35 (2.1)	28 (1.9)	40 (3.0)	48 (2.9)	42 (2.8)	42 (2.6)	46 (4.0)	42 (3.1)	44 (4.2)	40 (3.3)	15 (2.2)	10 (1.9)
<b>Countries Not Meeting Age/Grade Specifications (See Appendix A for Details):</b>												
Slovenia	43 (3.4)	49 (3.6)	40 (3.3)	49 (3.4)	36 (3.5)	39 (3.7)	52 (4.9)	66 (4.5)	62 (3.7)	56 (3.6)	13 (3.4)	16 (2.7)
<b>International Average</b>	37 (1.0)	38 (1.0)	39 (1.2)	▲ 45 (1.3)	39 (1.1)	40 (0.9)	37 (1.8)	39 (1.7)	45 (1.3)	44 (1.3)	17 (1.1)	17 (1.2)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

▲ = Difference from other gender statistically significant at .05 level, adjusted for multiple comparisons across each row

\* Fourth grade in most countries; see Table 2 for information about the grades tested in each country.

• Average of percentage scores across items in task: all items weighted equally (see overall task averages in Chapter 1)

† Met guidelines for sample participation rates only after replacement schools were included (see Appendix A for details)

<sup>†</sup> School-level exclusions for performance assessment exceed 25% of the National Desired Population (see Table A.3).

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

