

Outline of the Study

With 45 countries participating in the evaluation of two subjects involving 1 million students and 31 languages, this educational evaluation project was one of the largest and most ambitious ever undertaken on an international scale. The study was conducted by the International Association for the Evaluation of Educational Achievement (IEA), which includes universities, research institutions and ministries of education. In Québec, a group of researchers at the Université Laval, assisted by professionals from the Ministère de l'Éducation and from the company EDUCAN, carried out the study.

In 1994-95, achievement tests in mathematics and science were administered to samples of students in the same grade in various participating countries, following a rigorous random protocol. At the same time, students, teachers and school principals were asked to complete questionnaires. Students were asked about their opinions, attitudes and interests and teachers were asked about their general and professional education, their experience and their approach to teaching mathematics and science. School principals were asked about the school, the students and the teachers.

The achievement test for the third and fourth grades (population 1) contained 102 mathematics items and 97 science items divided among eight questionnaires of about 70 questions. The students had 90 minutes to answer one of the eight questionnaires, selected at random. The items covered the following content categories:

Mathematics	Science
Whole Numbers	Earth Science (geology, astronomy, meteorology. . .)
Fractions and Proportionality	Life Science (biology, botany, zoology. . .)
Measurement, Estimation and Number Sense	Physical Science (physics, chemistry, technology. . .)
Data Representation, Analysis and Probability	Environmental Issues and the Nature of Science (ecological issues, scientific method. . .)
Geometry	
Patterns, Relations and Functions	

The achievement tests for the first and second grades of secondary school (population 2) contained 151 mathematics items and 135 science items divided among nine questionnaires containing about 70 questions each. The students had 90 minutes to answer one of the nine questionnaires, selected at random.

Mathematics	Science
Fractions and Number Sense	Earth Science (geology, astronomy, meteorology. . .)
Geometry	Life Science (biology, botany, zoology. . .)
Algebra	Physics
Data Representation, Analysis and Probability	Chemistry
Measurement	Environmental Issues and the Nature of Science (ecological issues, scientific method. . .)
Proportionality	

Mathematics Achievement

Achievement results for the mathematics test are presented in Tables 1 to 4 at the end of the text. For each group of students they include the general average obtained for the entire test and the averages for each content area.

Twenty-four countries participated in the test for the **third grade**. Québec students obtained a general average of 55.7%. Only four countries recorded higher averages: Korea (66.9%), Japan (63.1%), Singapore (62.4%) and Hong Kong (59.3%). If these four countries are excluded, the results for Québec students were higher than those for all other countries, including those for Canada as a whole, which recorded a general average of 47.0%. The Québec results also surpassed those of the five other Canadian provinces with which it is possible to make comparisons: Alberta (51.1%), New Brunswick (47.6%), Newfoundland (45.2%), British Columbia (45.0%) and Ontario (41.9%).

Third-grade Québec students performed the best (73.6%) in the content category of geometry. Their results in other categories, in descending order, were as follows: whole numbers (64.9%); data representation, analysis and probability (61.1%); patterns, relations and functions (60.4%); measurement (51.2%); and fractions (35.0%). In relation to the students in the 24 participating countries, Québec students ranked first in geometry; fourth in data representation, analysis and probability as well as in patterns, relations and functions; fifth in whole numbers; and ninth in fractions. Québec students outperformed students in the five other Canadian provinces in four categories: geometry; whole numbers; patterns, relations and functions; and measurement. Among the provinces, Québec placed first with Alberta in data representation, analysis and probability and second, behind Alberta, in fractions.

For the **fourth-grade** test, there were 26 participating countries. Québec students obtained an average of 69.3%. The countries recording results higher than Québec were the same as those for the third-grade group: Korea (76.1%), Singapore (75.5%), Japan (74.2%) and Hong Kong (72.6%). If we exclude these four countries, Québec's results were comparable to those of the Netherlands and higher than those of all other participants, including Canada (60.5%). The average obtained by Québec students was higher than that of the students in the five other provinces. Alberta recorded an average of 65.0%, British Columbia, 58.5%, Newfoundland and New Brunswick, 58.2% and Ontario, 57.1%.

The achievement of **fourth-grade** Québec students, in the different content categories, resembles that of third-grade Québec students. They obtained an average of 79.7% in geometry; 77.9% in whole numbers; 77.0% in data representation, analysis and probability; 75.2% in patterns, relations and functions; 65.1% in measurement; and 51.5% in fractions. If we compare the results of Québec students with those of students in the 26 participating countries, we see that Québec students placed first in geometry; second in patterns, relations and functions; third in data representation, analysis and probability; fourth in whole numbers; seventh in fractions; and eighth in measurement. Québec students obtained the highest results among the Canadian provinces, matched only by Alberta in the category of data representation, analysis and probability and in the category of fractions.

For the **seventh grade**, 38 countries participated in the study. Results are given separately for students in the Flemish and French communities of Belgium. Thanks to an average of 60.5%, Québec students again ranked among the highest achievers. They were surpassed only by Singapore (72.8%), Japan (67.3%), Korea (67.0%), Hong Kong (65.4%) and the Flemish community of Belgium (65.1%). If these five countries are excluded, the results for Québec students exceeded those for all the other participants, including Canada (51.6%). Québec students outstripped the five other Canadian provinces, whose results ranged from 53.6% for Alberta to 46.9% for Newfoundland.

The results of **seventh-grade** Québec students in each category were as follows, in decreasing order: the highest result was obtained in data representation, analysis and probability (69.5%), followed by fractions and number sense (67.4%), geometry (64.6%), measurement (53.2%), algebra (49.3%) and proportionality (47.3%). Internationally Québec students ranked fourth in the categories of data representation, analysis and probability and in the category of geometry, fifth in the category of fractions and number sense, sixth in measurement, seventh in proportionality, and tenth in algebra. Québec students obtained higher results than students in other Canadian provinces in five categories and tied for first place with Alberta in the category of proportionality.

In the **eighth grade**, students in only three countries out of 40 obtained a general average higher than Québec: Singapore (78.9%), Japan (73.4%) and Korea (71.7%). Québec students recorded an average of 67.5%. This result is comparable to Hong Kong, the Flemish community of Belgium and the Czech Republic. It is higher than the averages of all other participants, including that for all Canadian students, which was 58.7%. The results of Québec students surpassed those of students in five other Canadian provinces, which ranged between 62.8% (British Columbia) and 53.9% (Ontario).

The results for Québec students in the **eighth grade**, for individual categories, were as follows: an average of 76.9% in the category of data representation, analysis and probability; 71.5% in geometry; 70.9% in fractions and number sense; 63.3% in algebra; 59.5% in measurement; and 54.4% in proportionality. In the category of data representation, analysis and probability, Québec ranked first among participating countries with Singapore, Korea and Japan, fourth in geometry and in fractions and number sense, and fifth in algebra, measurement, and proportionality. Québec students obtained higher results than students in other Canadian provinces in four categories out of six, and they ranked first among the provinces, along with British Columbia, in the category of fractions and number sense, and in proportionality.

Science Achievement

The achievement results of the science test are presented in Tables 5 to 8 at the end of the text.

Third-grade students in Québec obtained a general average of 53.2% on the science test. Of the 24 countries participating in this section of the study, five obtained results higher than those of Québec: Korea (67.1%), Japan (61.1%), Australia and the United States (56.5%) and the Netherlands (55.9%). The results of Québec students are comparable to those of students in eight other countries: in Table 5, these countries are listed from Austria to Scotland, and include Canada with 53.3%. Among the Canadian provinces, Alberta obtained a higher average than Québec with 59.5%. The results of Québec students are comparable to those of students in British Columbia and Newfoundland, and they are higher than those of students in Ontario and New Brunswick.

The **third-grade** test covered four science categories. Québec students obtained an average of 58.7% in the category of life science, 52.7% in earth science, 51.8% in physical science and 36.4% in environmental issues and the nature of science. Only two countries recorded averages higher than Québec in physical science, three countries scored higher in earth science and seven scored higher in life science. Québec students made their weakest international showing in the category of environmental issues and the nature of science, finishing behind 14 of the 24 countries, including Canada. In the category of life science, Québec finished behind Alberta and British Columbia, with a result comparable to that of Newfoundland and Ontario. In earth science, Alberta scored higher than Québec, whose results compared to those of British Columbia, Newfoundland and New Brunswick. In physical science also, Québec scored lower than Alberta, with results comparable to British Columbia and Newfoundland. In environmental issues and the nature of science, Québec students placed last, along with New Brunswick.

Fourth-grade students in Québec recorded an average of 64.5%. Twenty-six countries participated in this section of the study. Five obtained higher results than Québec—the same five leading countries as in the third-grade results: Korea (74.0%), Japan (69.7%), the Netherlands (67.1%), Australia (66.3%) and the United States (65.9%). Québec students obtained results comparable to those of students in six other countries, including Canada (63.6%). In Table 6, these countries are listed from Austria to England. Alberta students (with 67.9%) surpassed those of Québec. The results of Québec students are comparable to those of students in British Columbia (64.0%) and higher than the results of students in Newfoundland (62.2%), Ontario (61.9%) and New Brunswick (61.3%).

In the different content categories, Québec **fourth-grade** students obtained the following results: 67.8% in life science, 65.4% in physical science, 63.6% in earth science and 50.6% in environmental issues and the nature of science. Only two countries scored higher than Québec in the category of physical science and earth science. Eight countries scored higher results in life science. The lowest results recorded by Québec students were in the category of environmental issues and the nature of science, where they placed behind 15 of the 26 participating countries. Among Canadian provinces, Québec obtained its best results in physical science, along with Alberta, and in earth science, along with Alberta, British Columbia and Newfoundland. Québec students ranked second of the six provinces in life science, behind Alberta and equal to British Columbia and Ontario. In the category of environmental issues and the nature of science, Québec students scored lowest of all the provinces.

The **seventh-grade** science test included 38 participating countries. The results of the Flemish and French communities of Belgium are presented separately. Québec students obtained an average of 53.8%. Five countries obtained higher averages, ranging from 61.4% (Singapore) to 57.3% (Slovenia), as well as the Flemish community of Belgium (57.1%). The results of Québec students were comparable to those of students in 13 countries, including Canada (54.0%). These countries are listed from Bulgaria to Ireland in Table 7. In Canada, Québec's results were lower than those of Alberta (59.7%) and comparable to those of the four other provinces.

The **seventh-grade** science test included five content categories. Québec students obtained an average of 56.5% in the category of life science, 56.4% in earth science, 54.1% in physics, 53.2% in environmental issues and the nature of science, and 45.1% in chemistry. Internationally, Québec students placed third behind Singapore and the Flemish community of Belgium in earth science, seventh in environmental issues and the nature of science, eighth behind six countries and the Flemish community of Belgium in physics, eleventh in chemistry and twelfth after ten countries and the Flemish community of Belgium in life science. In relation to students from other Canadian provinces, Québec students ranked first with those of Alberta in earth science. Alberta supplanted Québec in the other four categories. Québec ranked second with the four other provinces in life science, and with British Columbia, Newfoundland and Ontario in physics and chemistry. In environmental issues and the nature of science, the students of Newfoundland supplanted those of Québec; Québec's results were comparable to those of the three other provinces.

Finally, in the **eighth-grade** test, Québec students obtained a general average of 59.0%. Nine countries obtained higher results than Québec, and there were 40 participants. The average of these countries varied from 69.6% (Singapore) to 61.3% (England). The results of Québec students were comparable to those of students in 14 countries and in the Flemish community of Belgium (the countries listed from Hungary to Israel in Table 8). Canada was among these countries, recording a general average of 58.7%. Québec's results were lower than those of Alberta (64.6%) and British Columbia (62.2%). They were comparable to those of Newfoundland (58.5%) and New Brunswick (57.2%), and higher than those of Ontario (55.5%).

Eighth-grade students in Québec obtained an average of 62.0% in the category of earth science, 59.9% in life science, 59.6% in physics, 56.8% in environmental issues and the nature of science, and 54.1% in chemistry. Among the 40 participating countries, Québec students were surpassed only by those of Slovenia in earth science, by seven other countries in physics, by nine countries in chemistry, by 11 countries in environmental issues and the nature of science, and by 18 countries in life science. Among Canadian provinces, Québec ranked first with Alberta among the six participating provinces in earth science. It obtained results higher than Ontario and comparable to the other provinces in chemistry. In life science, it ranked behind Alberta and British Columbia, along with the other provinces. In physics it ranked behind Alberta, with results comparable to those of British Columbia and Newfoundland. Finally, among Canadian provinces, Québec shared last place with Ontario in the category of environmental issues and the nature of science.

Distribution of Results by Gender

Below are the overall results of the science and mathematics tests, sorted by gender for each test. (The margin of error for each result appears in parentheses.)

	3 rd Grade		4 th Grade		7 th Grade		8 th Grade	
	Male	Female	Male	Female	Male	Female	Male	Female
Mathematics								
Québec	55.9 (1.5)	55.4 (1.1)	69.9 (1.1)	68.7 (1.6)	58.9 (1.7)	61.9 (1.8)	66.4 (1.7)	68.6 (1.8)
Canada (including Québec)	48.3 (0.7)	45.9 (0.8)	60.9 (1.1)	60.0 (1.2)	51.7 (0.6)	51.7 (0.6)	58.6 (0.7)	59.2 (0.6)
International Average	47.5 (0.2)	46.3 (0.2)	59.3 (0.2)	59.0 (0.2)	49.7 (0.2)	48.9 (0.2)	55.7 (0.2)	54.7 (0.2)
Science								
Québec	54.3 (1.5)	51.8 (1.3)	65.6 (1.1)	63.3 (0.7)	54.0 (2.2)	53.6 (1.5)	59.4 (1.7)	58.6 (1.5)
Canada (including Québec)	53.9 (0.7)	52.7 (0.6)	64.3 (0.7)	63.0 (0.6)	55.0 (0.6)	53.1 (0.5)	59.7 (0.6)	57.9 (0.6)
International Average	51.0 (0.2)	49.6 (0.2)	60.0 (0.2)	58.8 (0.1)	51.1 (0.2)	48.5 (0.2)	57.0 (0.2)	54.1 (0.2)

In the collective results for all the countries participating in the **mathematics** tests, a slight advantage of boys over girls was observed in the third, seventh and eighth grades. The differences, however, are minimal. In the fourth grade no significant difference was observed. In Canada, the only significant difference favouring boys was observed in the third grade. However, this difference was no greater than that observed in the other participating countries. In Québec, no significant difference was noted between the results for boys and girls in any group of students.

In the collective results for all the countries participating in the **science** tests, a slight advantage of boys over girls was observed. In the third and fourth grades there was one percentage point difference between boys and girls and in the seventh and eighth grades there was a difference of two percentage points. In Canada, no significant difference was noted in the third and fourth grades, but there was a slight advantage of boys over girls in the seventh and eighth grades. In Québec, however, no significant difference was observed in the third, seventh and eighth grades, though a minimal difference in favour of boys existed for the fourth grade.

Conclusion

During the last twenty years, Québec has participated in several international studies, both in mathematics and science. We will limit our discussion here to the international studies done in 1991 and 1995. Given the differences in the number and identity of participants and in the tests administered, it is difficult to establish strict comparisons between the results of the 1991 study by the International Assessment of Educational Progress (IAEP) and the Third International Mathematics and Science Study (TIMSS). Nevertheless, it is possible to discern certain trends.

Mathematics Achievement:

At the international level, Québec students placed among the frontrunners in the two studies mentioned above. Furthermore, their position in this ranking improved, if we compare the Québec results with those of the other countries that participated in both studies. For example, in the third and fourth grades (9-year-olds), the marks of Québec students were higher than those of Hungary, Scotland and Israel in 1995, whereas in 1991 they were lower or comparable. In the first and second years of secondary school (13-year-olds), Korea recorded higher results than Québec in both studies; on the other hand, Québec's performance was comparable to that of Switzerland in 1991, but higher than that of Switzerland in 1995.

Fewer Canadian provinces participated in the 1995 study. In comparing the results for the provinces, it can be seen that Québec ranked first among Canadian provinces in both studies for all the populations evaluated. This first place among Canadian provinces is also confirmed by the results of 13-year-old Québec students in the Canada-wide studies (1993 and 1997) of the School Achievement Indicators Program (SAIP) of the Council of Ministers of Education (Canada).

Science Achievement:

At the international level, the Québec results were comparable for both 1991 and 1995. At the Canadian level, the results of Alberta were higher than those of Québec in both 1995 and 1991. These results are consistent with those observed in the SAIP Canada-wide study (1996) of the Council of Ministers of Education (Canada).

In comparing the performance of Québec students in each category of mathematics and science with that of students in countries whose results were higher than or comparable to Québec, we observe the following similarities:

- In the third and fourth grades, students scored their highest marks in the science items related to life science, and their lowest in items covering environmental issues and the nature of science.
- In the first and second years of secondary school, the science items pertaining to life science yielded the highest results, while those pertaining to chemistry yielded the lowest.
- In the third and fourth grades, students did best on the mathematics items pertaining to geometry and whole numbers, while their weakest results were on the items pertaining to fractions, proportionality and measurement.
- In the first and second years of secondary school, students scored highest in mathematics on the data representation, analysis and probability items, and on the fractions and number sense items, while their lowest scores were recorded on items pertaining to proportionality and measurement.
- In the first year of secondary school, the mathematics items related to algebra also yielded some of the lowest scores.

These observations are especially important at a time when Québec is reviewing its mathematics and science programs. In spite of certain weaknesses, we can conclude that the achievement of Québec students in mathematics and science is satisfactory and demonstrates that Québec's education system is on the right track.

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**Other Education
Statistics Bulletins
available:**

- Lespérance, André. *Level of Graduation Upon Leaving the Education System*, No. 1, November 1997.
- Demers, Marius. *Statutory Salaries and Teaching Time of Teachers in Public Elementary and Lower Secondary Schools: A Comparison of Québec and OECD countries*, No. 2, November 1997.
- Demers, Marius. *Educational Expenditure Relative to the GDP: A Comparison of Québec and OECD Countries*, No. 3, June 1998.
- Maheu, Robert. *Graduation from Secondary School, College and University in 1995: A Comparison of Québec and OECD Countries*, No. 4, June 1998.
- Beauchesne, Luc. *Secondary School and College Graduates: A Sociodemographic Analysis*, No. 5, June 1998.

Table 1

Results of third-grade students on the mathematics test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Whole Numbers	Fractions	Measurement	Data Representation. Analysis and Probability	Geometry	Patterns. Relations and Functions
Korea		66.9	80.7	53.0	61.3	69.7	67.1	72.9
Japan		63.1	72.4	52.4	60.0	69.5	62.0	64.4
Singapore		62.4	75.0	54.7	51.7	68.0	60.3	65.1
Hong Kong		59.3	68.1	48.3	55.6	63.0	65.5	57.9
	Québec	55.7	64.9	35.0	51.2	61.1	73.6	60.4
Netherlands		52.1	57.4	39.1	53.8	56.0	60.7	50.3
Czech Republic		52.0	59.4	37.7	53.8	51.1	61.5	53.3
	Alberta	51.1	56.2	39.7	43.5	58.1	66.8	50.4
Slovenia		51.0	60.2	36.3	46.7	51.8	64.4	53.8
Austria		49.7	58.0	34.7	54.9	48.4	56.6	48.3
Australia		49.7	53.8	37.8	47.9	51.3	64.9	49.5
United States		49.2	57.1	36.4	40.9	55.8	61.1	52.6
Hungary		48.9	61.8	34.5	47.2	44.5	52.5	56.6
Ireland		47.8	54.8	41.0	41.2	49.6	54.7	47.9
	New Brunswick	47.6	51.9	37.6	40.0	53.8	62.4	47.4
Canada (including Québec)		47.0	52.6	33.5	42.0	52.0	62.5	47.8
	Newfoundland	45.2	52.0	32.1	39.3	51.0	58.5	45.5
	British Columbia	45.0	48.7	32.7	40.6	53.3	62.7	39.5
Scotland		44.8	46.5	32.6	41.3	48.6	65.2	45.2
England		44.7	45.5	34.3	41.7	49.8	63.2	42.6
Latvia		44.6	50.0	29.8	47.9	39.5	56.5	53.1
	Ontario	41.9	46.4	31.1	37.5	45.0	55.9	42.6
New Zealand		40.8	42.0	30.3	38.4	43.3	58.1	41.2
Thailand		39.9	47.3	32.6	35.4	41.1	44.1	40.2
Cyprus		38.3	48.1	31.1	35.0	33.4	41.5	40.5
Portugal		37.2	45.9	29.5	37.1	30.8	42.2	36.5
Greece		37.1	46.0	29.9	35.7	34.6	41.3	33.0
Norway		35.5	40.1	24.0	38.1	36.9	44.0	33.8
Iceland		35.2	37.2	25.4	33.2	38.8	50.3	32.4
Iran. Islamic Republic		27.8	37.7	19.6	28.7	16.6	33.1	29.8
International Average		46.9	54.1	35.8	44.6	47.7	55.6	47.9

Table 2

Results of fourth-grade students on the mathematics test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Whole Numbers	Fractions	Measurement	Data Representation. Analysis and Probability	Geometry	Patterns. Relations and Functions
Korea		76.1	87.9	65.0	71.7	79.7	71.8	83.0
Singapore		75.5	82.6	73.9	66.7	80.8	72.1	76.0
Japan		74.2	81.9	65.3	72.3	79.0	72.3	76.3
Hong Kong		72.6	78.5	66.3	69.2	75.7	74.4	72.9
	Québec	69.3	77.9	51.5	65.1	77.0	79.7	75.2
Netherlands		69.3	75.4	59.9	69.6	75.4	71.0	65.2
Czech Republic		66.1	74.5	52.7	67.7	67.1	70.7	66.9
Austria		65.3	74.1	51.5	69.3	66.5	67.4	64.3
	Alberta	65.0	71.6	54.4	56.2	73.6	75.5	65.7
Slovenia		64.4	73.8	50.0	64.0	63.9	71.7	68.1
Hungary		63.7	76.2	49.2	64.3	60.4	65.6	69.4
Ireland		63.5	70.2	57.8	55.9	68.8	66.5	63.6
Australia		62.8	67.3	51.3	59.8	67.2	74.3	63.9
United States		62.7	70.6	50.7	52.8	73.0	70.9	66.1
Canada (including Québec)		60.5	67.8	47.5	54.0	67.6	71.7	61.6
Israel		59.3	70.6	47.6	54.0	63.9	62.0	60.2
Latvia		58.5	67.7	43.7	60.1	53.6	66.5	65.4
	British Columbia	58.5	64.0	45.9	54.6	67.1	68.6	57.9
	Newfoundland	58.2	64.8	45.7	52.6	65.0	69.0	59.7
	New Brunswick	58.2	65.5	46.1	50.8	63.3	72.3	57.6
Scotland		58.0	61.3	46.5	53.2	66.0	72.4	57.4
	Ontario	57.1	64.1	45.5	49.8	63.7	69.2	57.6
England		56.5	58.2	45.5	51.9	64.3	73.6	54.9
Cyprus		53.8	65.0	47.7	47.9	52.4	52.6	55.4
Norway		53.3	61.2	38.4	55.7	59.5	57.6	50.3
New Zealand		53.2	57.0	41.4	48.8	60.9	66.3	52.5
Greece		50.8	62.0	41.9	48.2	49.9	53.3	46.8
Thailand		50.5	58.4	43.6	43.6	55.6	53.0	49.9
Iceland		49.7	56.3	35.7	44.1	58.4	62.6	48.4
Portugal		48.0	57.3	38.2	49.4	43.2	52.2	47.2
Iran. Islamic Republic		38.0	50.6	32.1	36.1	23.2	42.4	39.7
Kuwait		31.6	36.1	24.7	34.7	26.3	36.1	32.9
International Average		59.2	67.0	48.8	56.3	61.6	64.3	59.9

Table 3

Results of seventh-grade students on the mathematics test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Fractions and Number Sense	Geometry	Algebra	Data Representation, Analysis and Probability	Mesurement	Proportionality
Singapore		72.8	79.3	68.6	68.0	72.2	70.0	70.5
Japan		67.3	71.0	70.4	63.8	72.7	61.6	54.8
Korea		67.0	69.7	70.5	63.9	73.0	62.3	54.7
Hong Kong		65.4	67.0	67.6	65.6	68.5	61.5	55.3
Belgium (Flemish)		65.1	72.3	58.5	60.3	73.1	59.5	54.2
	Québec	60.5	67.4	64.6	49.3	69.5	53.2	47.3
Czech Republic		57.2	60.9	58.4	55.1	61.5	54.8	41.1
Austria		55.5	60.8	52.4	48.2	63.0	55.1	43.7
Bulgaria		55.4	56.0	60.5	57.6	55.5	51.6	43.9
Netherlands		55.1	60.1	53.8	41.6	68.6	52.2	51.4
Belgium (French)		54.4	59.1	54.7	43.9	64.1	53.4	43.7
Slovakia		54.1	58.1	56.5	50.5	56.1	52.1	40.8
Hungary		53.8	58.6	51.9	52.3	59.8	48.9	38.4
	Alberta	53.6	60.1	49.5	45.9	66.4	45.6	43.8
Ireland		53.3	62.3	42.7	47.0	63.5	45.8	46.4
Switzerland		53.1	59.9	46.2	41.1	65.5	52.9	44.3
Russian Federation		52.9	55.7	54.7	55.0	54.5	47.4	39.7
Slovenia		52.5	56.1	52.5	48.0	60.1	49.7	39.4
Australia		52.4	56.4	51.6	46.6	62.6	47.8	40.7
Thailand		51.9	56.2	57.4	44.9	57.0	44.2	45.6
Canada (including Québec)		51.6	58.3	50.4	42.5	62.7	44.0	41.8
France		51.0	53.1	58.2	39.0	62.7	48.7	41.1
Germany		49.0	55.2	46.2	38.7	60.9	46.3	37.0
	Ontario	48.2	54.4	45.4	40.3	60.0	40.5	39.1

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Table 3 (cont.)

Results of seventh-grade students on the mathematics test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Fractions and Number Sense	Geometry	Algebra	Data Representation, Analysis and Probability	Mesurement	Proportionality
United States		47.7	54.2	43.6	43.5	60.2	35.9	38.1
	New Brunswick	47.7	54.8	45.8	40.0	57.7	39.0	38.4
	British Columbia	47.5	53.6	45.9	39.7	58.9	40.5	36.7
England		47.2	47.6	48.9	41.2	61.8	43.1	38.2
Sweden		47.0	51.0	43.0	35.3	64.0	46.5	35.6
	Newfoundland	46.9	52.4	46.4	40.0	58.4	38.4	36.3
New Zealand		46.3	49.8	45.5	39.5	58.7	40.5	37.6
Scotland		44.3	46.9	46.0	36.1	57.6	40.2	34.1
Norway		44.3	48.7	42.2	32.4	58.5	43.6	34.4
Latvia		44.2	45.6	47.6	42.8	48.7	41.1	32.7
Denmark		44.1	45.0	46.5	36.0	58.7	41.1	34.2
Romania		43.4	42.6	47.7	45.8	43.6	41.7	35.5
Iceland		43.3	48.6	46.7	30.8	56.0	37.8	32.9
Spain		42.4	42.8	43.2	40.6	52.0	37.7	34.9
Cyprus		42.0	45.9	42.9	38.6	47.8	34.4	35.7
Greece		40.5	46.7	39.2	33.1	46.4	35.0	34.1
Lithuania		38.1	41.0	38.3	38.5	43.6	32.4	24.6
Portugal		36.6	39.0	37.8	31.0	46.5	33.8	25.0
Iran, Islamic Republic		32.3	34.3	39.5	28.5	35.7	23.3	30.4
Colombia		26.1	28.2	26.0	23.5	32.3	21.7	20.5
South Africa		22.5	25.9	21.7	20.3	25.0	17.3	20.2
International Average		49.3	53.1	49.5	43.9	57.3	45.0	39.7

Table 4

 Results of eighth-grade students on the mathematics test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95
 (averages in percentage)

Country	Canadian Province	General Average	Fractions and Number Sense	Geometry	Algebra	Data Representation, Analysis and Probability	Mesurement	Proportionality
Singapore		78.9	83.5	76.3	76.1	78.9	76.7	75.4
Japan		73.4	75.2	79.6	72.2	77.7	67.4	60.9
Korea		71.7	74.0	75.2	69.4	77.8	65.8	61.5
Hong Kong		69.9	72.0	72.9	69.6	71.6	65.2	61.6
	Québec	67.5	70.9	71.5	63.3	76.9	59.5	54.4
Belgium (Flemish)		65.8	71.4	63.6	62.5	72.5	59.9	52.7
Czech Republic		65.5	68.9	66.4	65.2	68.4	62.1	51.6
	British Columbia	62.8	69.4	59.4	57.4	71.7	55.1	53.2
Slovakia		62.3	66.1	63.3	62.4	61.7	60.4	49.1
Switzerland		62.0	66.7	59.5	53.2	72.2	60.7	52.2
Austria		61.9	65.9	57.2	59.2	68.5	61.6	48.9
Hungary		61.5	64.9	60.3	63.2	65.9	56.4	46.7
France		61.3	64.2	65.7	54.2	70.7	56.9	48.9
Slovenia		61.2	63.2	60.4	61.2	66.1	58.7	49.4
	Alberta	60.6	66.2	57.7	55.5	71.1	53.8	47.6
Russian Federation		60.1	61.7	63.4	62.6	60.2	56.1	48.1
Netherlands		59.8	61.7	59.5	52.8	72.2	57.1	51.4
Bulgaria		59.6	60.0	65.4	61.9	62.0	54.1	47.5
Canada (including Québec)		58.7	63.8	57.8	53.6	68.7	51.3	47.7
Ireland		58.7	64.9	51.3	53.4	69.4	52.8	50.7
Belgium (French)		58.7	61.9	58.4	53.4	67.8	55.5	47.6
Australia		58.1	60.8	57.4	54.9	67.5	53.9	46.7
Thailand		57.4	60.0	61.7	53.4	62.7	50.5	51.3
Israel		57.3	60.3	57.4	60.5	62.9	48.2	43.4

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Table 4 (cont.)

Results of eighth-grade students on the mathematics test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Fractions and Number Sense	Geometry	Algebra	Data Representation, Analysis and Probability	Mesurement	Proportionality
	Newfoundland	55.9	60.6	53.8	53.6	65.8	46.0	46.7
Sweden		55.6	62.0	48.3	43.9	69.8	55.7	44.3
	New Brunswick	54.3	60.8	51.6	48.5	62.7	47.5	44.2
Germany		53.9	58.2	51.2	47.9	64.3	51.1	41.9
	Ontario	53.9	59.5	51.6	48.0	64.2	46.4	43.8
New Zealand		53.9	56.5	54.5	48.8	66.2	48.2	42.3
Norway		53.6	58.1	50.9	45.4	66.3	51.3	40.2
England		53.1	53.7	54.4	48.6	66.1	49.7	41.4
United States		53.0	59.4	48.3	50.8	65.3	39.9	42.1
Denmark		52.2	53.1	54.4	45.1	66.6	49.4	40.9
Scotland		51.6	53.2	52.1	46.1	65.1	48.1	40.1
Latvia		51.5	52.6	56.8	50.5	55.8	47.2	39.2
Spain		51.0	51.8	49.2	54.2	60.0	44.1	40.2
Iceland		49.8	54.2	51.0	40.0	62.8	44.8	38.4
Greece		49.3	52.7	50.6	45.9	56.3	43.2	39.3
Romania		48.9	48.0	52.2	52.0	48.5	48.0	41.7
Lithuania		48.4	51.2	53.3	47.2	52.0	42.6	34.6
Cyprus		47.8	49.7	47.2	47.8	52.8	43.5	39.6
Portugal		42.9	43.8	44.2	39.7	54.0	39.0	31.5
Iran, Islamic Republic		37.9	39.0	42.8	37.2	41.3	29.4	36.2
Kuwait		29.8	27.5	37.7	29.7	38.5	23.5	20.8
Colombia		29.4	30.7	29.1	28.0	37.0	24.6	22.9
South Africa		23.7	25.8	24.4	23.0	26.4	18.0	21.3
International Average		55.1	57.9	55.7	52.4	62.4	50.5	44.7

Table 5

Results of third-grade students on the science test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95
(averages in percentage)

Country	Canadian Province	General Average	Earth Science	Life science	Physical Science	Environmental Issues and the Nature of Science
Korea		67.1	64.2	69.9	67.3	60.3
Japan		61.1	58.3	65.0	60.8	51.7
	Alberta	59.5	56.4	64.7	56.1	54.2
Australia		56.5	53.6	62.5	52.6	50.0
United States		56.5	55.0	62.1	51.5	51.9
Netherlands		55.9	49.1	63.2	52.8	47.8
	British Columbia	55.7	54.3	62.1	50.5	48.9
Austria		54.6	53.6	61.3	51.0	40.8
Czech Republic		54.6	52.7	61.2	51.4	41.4
England		54.5	53.5	59.6	51.9	44.6
Canada (including Québec)		53.3	51.7	58.9	49.9	44.0
	Québec	53.2	52.7	58.7	51.8	36.4
Singapore		53.1	50.7	57.8	52.3	41.0
Slovenia		53.0	51.7	58.2	50.8	41.7
	Newfoundland	52.9	51.7	57.3	50.5	44.8
Hong Kong		52.5	52.3	58.5	50.5	35.9
Scotland		51.4	50.0	57.0	48.1	41.7
Ireland		51.1	50.3	56.0	47.5	43.6
	Ontario	51.0	49.4	56.7	47.1	43.2
	New Brunswick	50.9	50.7	55.9	48.3	39.3
New Zealand		50.6	47.8	56.9	46.7	42.9
Hungary		49.7	47.3	54.9	47.8	39.0
Latvia		48.3	48.1	52.4	46.4	37.8
Norway		45.8	46.5	52.0	41.1	34.1
Greece		44.3	43.0	50.7	40.4	32.7
Iceland		42.3	43.6	46.5	40.2	30.2
Thailand		41.8	41.1	45.0	39.0	39.4
Portugal		41.0	40.1	45.5	39.6	29.1
Cyprus		39.4	40.1	42.7	38.0	29.8
Iran, Islamic Republic		30.0	29.3	32.8	30.1	19.9
International Average		50.4	48.9	55.4	47.8	40.5

Table 6

Results of fourth-grade students on the science test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Earth Science	Life science	Physical Science	Environmental Issues and the Nature of Science
Korea		74.0	71.5	75.5	74.7	69.6
Japan		69.7	66.4	73.0	69.6	62.5
	Alberta	67.9	64.7	72.9	64.3	64.8
Netherlands		67.1	61.2	72.8	64.8	61.0
Australia		66.3	61.1	72.0	62.5	63.3
United States		65.9	63.7	71.3	60.5	64.9
Austria		65.7	61.8	71.9	63.9	53.7
Czech Republic		65.5	63.9	71.3	62.0	55.7
	Québec	64.5	63.6	67.8	65.4	50.6
Singapore		64.2	58.1	69.5	64.3	53.2
	British Columbia	64.0	64.0	67.9	61.3	57.0
Slovenia		63.7	63.9	67.9	61.2	54.2
Canada (including Québec)		63.6	61.6	68.5	61.0	56.0
England		63.2	61.4	68.0	60.4	56.1
	Newfoundland	62.2	62.1	66.0	59.4	56.1
Hong Kong		62.2	60.9	67.8	59.8	49.6
	Ontario	61.9	59.7	67.4	57.9	56.2
Hungary		61.6	61.9	66.4	59.1	50.1
	New Brunswick	61.3	59.8	65.9	57.3	57.4
Ireland		61.0	60.3	65.5	57.2	55.4
Norway		60.5	59.9	66.7	55.1	53.0
New Zealand		60.4	57.5	66.0	56.8	53.9
Scotland		60.3	57.8	65.5	57.4	53.1
Israel		56.7	51.3	61.4	55.5	51.4
Latvia		56.0	56.7	59.9	54.1	45.7
Iceland		55.1	54.7	59.6	51.9	47.3
Greece		53.8	51.8	61.0	49.2	42.9
Cyprus		50.6	47.5	54.7	49.8	41.7
Portugal		50.2	49.7	53.7	49.3	39.5
Thailand		49.3	47.8	52.4	46.5	47.6
Iran. Islamic Republic		39.8	37.5	44.0	40.1	25.7
Kuwait		39.0	36.5	44.7	37.4	25.3
International Average		59.4	57.2	64.3	57.1	51.3

Table 7

Results of seventh-grade students on the science test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Earth Science	Life Science	Physics	Chemistry	Environmental Issues and the Nature of Science
Singapore		61.4	60.1	62.3	63.3	56.7	62.4
Korea		61.4	58.7	65.2	63.0	53.7	61.1
	Alberta	59.7	57.0	64.6	59.6	51.4	61.7
Japan		59.2	56.3	63.6	63.3	49.3	53.4
Czech Republic		58.4	57.1	63.4	57.7	54.2	53.7
Slovenia		57.3	58.8	60.3	55.3	54.5	55.4
Belgium (Flemish)		57.1	60.3	60.6	58.3	46.0	54.2
Bulgaria		56.4	53.3	60.1	57.0	55.9	49.3
Netherlands		55.9	56.5	61.2	55.1	43.8	58.4
England		55.6	55.5	57.1	57.5	48.0	56.5
Hungary		55.5	54.1	60.7	54.1	54.2	48.4
Austria		55.4	55.5	60.0	55.2	51.0	48.6
Slovakia		54.2	55.3	56.0	55.5	49.9	50.1
United States		54.0	54.4	58.6	51.2	47.8	56.3
Canada (including Québec)		54.0	53.4	57.3	54.2	45.9	55.7
Australia		53.8	52.4	56.4	55.0	45.9	56.5
	Québec	53.8	56.4	56.5	54.1	45.1	53.2
Hong Kong		53.2	49.5	56.4	55.3	48.7	50.6
Germany		52.8	51.8	58.0	53.3	46.9	46.3
	Newfoundland	52.7	52.8	55.5	52.7	43.8	56.8
Thailand		52.6	49.9	61.9	50.0	38.4	57.4
	British Columbia	52.4	49.8	55.3	53.6	45.5	55.9
	Ontario	52.1	50.3	55.9	52.4	43.4	54.9
Ireland		52.0	56.4	52.5	50.7	47.0	54.3

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Table 7 (cont.)

Results of seventh-grade students on the science test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95
(averages in percentage)

Country	Canadian Province	General Average	Earth Science	Life Science	Physics	Chemistry	Environmental Issues and the Nature of Science
Sweden		51.4	53.3	55.8	50.9	45.2	45.7
	New Brunswick	51.4	49.5	56.0	51.7	41.2	54.1
New Zealand		50.4	49.4	53.1	51.0	42.3	53.4
Norway		50.4	52.0	54.8	50.7	39.9	48.4
Switzerland		50.1	52.1	53.0	51.8	41.3	45.8
Russian Federation		50.0	54.3	53.8	49.7	42.4	43.1
Spain		49.3	51.5	52.5	48.5	43.4	46.9
Scotland		48.2	46.3	49.4	51.2	41.0	49.6
Iceland		46.3	44.6	51.0	49.0	36.0	41.9
France		46.1	45.2	49.7	47.8	38.3	43.5
Belgium (French)		45.0	45.7	48.7	46.3	37.4	40.1
Romania		44.8	44.0	50.6	43.8	41.3	36.8
Greece		44.5	42.7	48.0	44.0	41.1	43.5
Denmark		44.1	41.8	49.5	46.7	33.8	39.0
Iran, Islamic Republic		41.9	40.5	44.7	40.8	46.0	33.2
Latvia		41.7	42.5	44.6	43.3	33.8	38.4
Portugal		41.3	45.5	45.5	39.5	34.5	37.0
Cyprus		40.0	39.1	42.4	39.2	37.5	39.5
Lithuania		37.5	39.1	40.3	40.3	28.2	32.1
Colombia		35.0	33.0	39.0	34.5	29.1	35.6
South Africa		25.5	26.2	26.4	25.7	22.8	25.2
International Average		49.8	49.7	53.4	50.3	43.4	47.4

Table 8

Results of eighth-grade students on the science test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Earth Science	Life Science	Physics	Chemistry	Environmental Issues and the Nature of Science
Singapore		69.6	64.6	71.9	68.9	68.7	74.2
Korea		65.5	62.6	69.9	64.6	62.9	63.9
Japan		65.3	60.7	70.8	66.6	60.6	59.5
	Alberta	64.6	63.9	69.1	62.8	57.0	68.0
Czech Republic		64.1	63.5	68.6	63.6	60.4	59.1
Netherlands		62.3	60.7	66.7	62.6	52.4	65.3
	British Columbia	62.2	57.7	66.9	62.4	56.9	63.0
Bulgaria		61.7	58.1	64.3	59.9	65.5	59.4
Slovenia		61.7	64.3	64.6	60.8	56.4	58.6
Austria		61.5	61.9	64.7	61.7	58.4	55.0
England		61.3	59.4	63.9	61.6	55.3	64.5
Hungary		60.7	59.5	65.4	59.6	60.0	53.2
Belgium (Flemish)		60.2	62.1	63.8	60.6	51.2	57.6
Australia		59.9	57.3	63.3	59.8	54.0	62.5
Slovakia		59.4	59.8	60.3	61.2	57.4	53.5
	Québec	59.0	62.0	59.9	59.6	54.1	56.8
Sweden		58.8	61.6	62.6	57.2	55.8	51.9
Canada (including Québec)		58.7	57.5	62.0	58.7	51.8	60.7
	Newfoundland	58.5	58.2	61.4	57.7	51.2	63.0
Ireland		58.4	61.4	60.1	56.3	54.1	60.1
United States		58.3	58.0	62.6	55.8	53.1	60.7
Russian Federation		58.3	58.5	62.4	57.5	57.4	49.5
Germany		57.9	56.7	62.9	57.4	54.5	51.3
New Zealand		57.6	55.5	60.4	57.9	52.8	59.0
Norway		57.6	61.5	61.0	56.9	49.2	55.4

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Table 8 (cont.)

Results of eighth-grade students on the science test in the Third International Mathematics and Science Study (TIMSS), by content category, 1994-95 (averages in percentage)

Country	Canadian Province	General Average	Earth Science	Life Science	Physics	Chemistry	Environmental Issues and the Nature of Science
Hong Kong		57.6	54.0	61.1	58.2	54.8	55.2
Thailand		57.3	56.3	66.1	54.0	43.2	61.9
	New Brunswick	57.2	53.2	61.2	57.2	51.2	59.7
Israel		56.7	54.9	60.6	57.0	53.3	52.0
Switzerland		56.3	57.8	59.3	57.7	49.5	50.9
Spain		55.6	56.7	58.3	55.1	51.4	53.0
	Ontario	55.5	51.9	59.1	56.8	46.8	59.3
Scotland		55.3	52.3	56.5	57.0	51.2	57.3
France		53.7	54.7	56.0	54.3	47.1	53.1
Iceland		52.1	50.0	57.9	53.2	42.4	48.9
Greece		52.0	49.0	53.6	52.8	51.3	50.9
Denmark		50.7	48.6	55.9	52.8	40.8	46.8
Belgium (French)		50.2	50.0	54.8	51.3	41.3	46.2
Latvia		50.2	47.9	52.8	51.3	47.7	46.8
Portugal		49.9	50.2	53.1	48.2	50.1	44.7
Romania		49.6	49.4	55.1	48.5	46.4	41.5
Lithuania		48.9	46.3	51.9	51.3	47.6	39.9
Iran, Islamic Republic		47.4	44.9	48.6	48.0	52.2	38.9
Cyprus		46.6	46.1	48.5	45.9	44.8	46.4
Kuwait		42.7	43.2	44.7	43.1	40.0	39.2
Colombia		38.7	37.1	43.7	37.4	31.7	40.0
South Africa		26.7	26.1	26.8	27.3	26.4	25.6
International Average		55.5	54.6	59.0	55.5	51.3	53.0