**Programme for International Student Assessment** - (PISA) 2003

# The Performance of Canadian Youth in Mathematics, Reading, Science and Problem Solving

## Results for Québec Students Aged 15

Reach for your Dreams

Québec

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**The Performance of Québec Students Aged 15 in Mathematics, Reading, Science and Problem Solving**

**Programme for International Student Assessment (PISA) 2003**

## Overview of the assessment

The member countries of the Organisation for Economic Co-operation and Development (OECD) launched the *Programme for International Student Assessment* (PISA) to provide policy-oriented international indicators on the knowledge and skills of 15-year-old students.[1] PISA is based on a dynamic model of lifelong learning in which new knowledge and skills necessary for successful adaptation to a changing world are continuously acquired throughout life.[2] PISA assesses what 15-year-olds are capable of accomplishing with what they have learned at school, at home or in their communities. As such, PISA examines young people's ability to think and to apply their knowledge and skills.

PISA follows a three-year cycle, the first of which took place in 2000. This program assesses the reading literacy, mathematical literacy and scientific literacy of young people aged 15. Every three years, PISA reports on the results achieved in these three domains but presents more detailed results for the major domain assessed in each particular round. Mathematics was the major domain of PISA 2003, so the primary focus was on overall mathematical literacy, covering four specific subdomains: quantity; space and shape; change and relationships; and uncertainty. While the 2003 cycle contained only basic measures for reading literacy and scientific literacy, PISA 2000 provided an in-depth look at reading, and PISA 2006 will do the same for science.

A total of 41 countries took part in PISA 2003. Statistics Canada put together a national sample representative of schools and classes from the ten Canadian provinces. Québec provided a large enough sample so that its results would appear separately from those for Canada as a whole.

The 2003 PISA test was administered in the schools during regular class time in April and May 2003. The assessment was a two-hour paper-and-pencil test. Students also completed a 30-minute background questionnaire designed to collect data on each of the students and on their home lives, while school principals filled out a 20-minute questionnaire about their school.

In Québec, 131 schools and 3 357 students aged 15 participated in the assessment.

Since mathematics was the major focus of PISA 2003, the results of this cycle bear chiefly on overall mathematical literacy and on four mathematics subdomains (quantity; space and shape; change and relationships; and uncertainty). Basic measures for reading literacy, scientific literacy and problem-solving skills are also provided.

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[1] OECD, *Measuring Student Knowledge and Skills: A New Framework for Assessmen*t, Paris, 1999.

[2] OECD, *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills*, Paris, 2003.

This publication presents the results of Québec's 15-year-olds and compares their achievements with those of their counterparts from around the world and in Canada. The data are taken from the Canadian report titled *Measuring up: The performance of Canada's youth in reading, mathematics and science, OECD PISA Study – First Results for Canadians aged 15,* **which can be downloaded free of charge from any of the following Web sites:**
**<www.pisa.gc.ca>**
**<www.statcan.ca>**
**<www.cmec.ca>**
**<www.hrdc-drhc.gc.ca/arb>**

## Part 1: Students' mathematics achievements

### 1.1 Assessment context

As measured by the PISA assessment, proficiency in mathematics means more than just the ability to perform calculations. In fact, the items on this test stress the practical application of mathematical knowledge in a variety of different contexts and situations. That approach is reflected in the following definition of mathematical literacy adopted for PISA:

> *An individual's capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen* (OECD 2003).

In short, the aim of the mathematics section in PISA was to determine how well students are able to apply various mathematical processes to a range of situations. In addition to the results based on the overall mathematics score, additional insights are provided by examining the students' performance in the four individual mathematical subdomains (space and shape; change and relationships; quantity; and uncertainty).

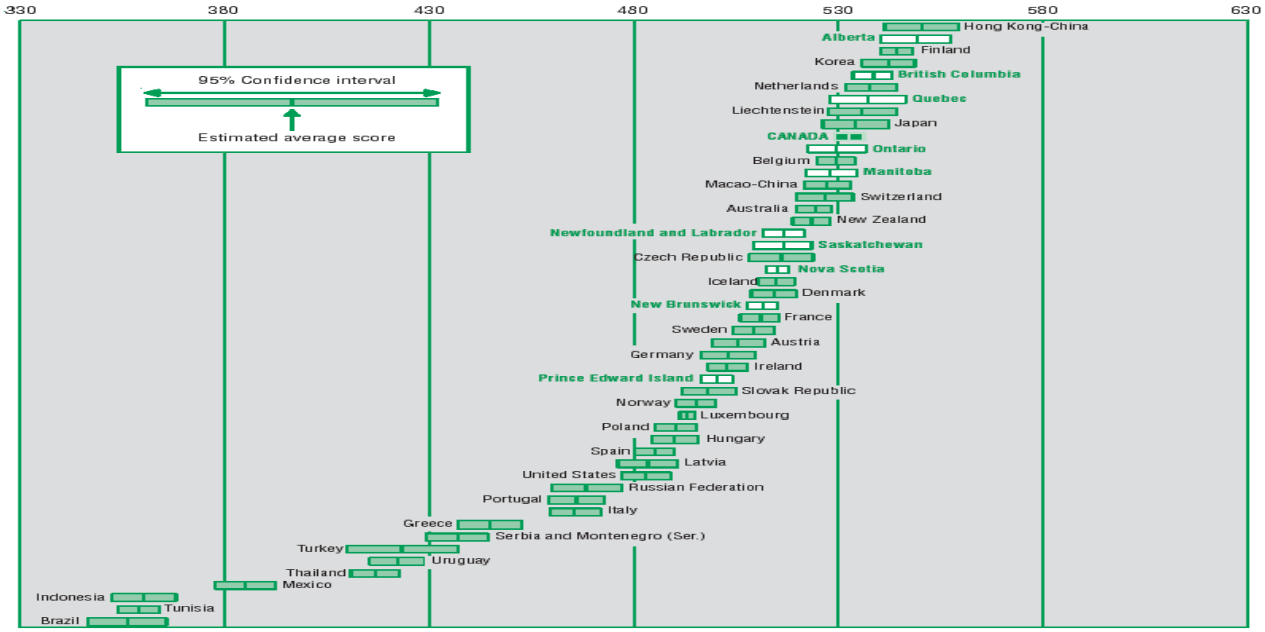
### 1.2 Québec students' results in mathematics

Québec's 15-year-olds ranked fifth among the 41 participating countries and third among the Canadian provinces. No country or province performed significantly better than Québec. Thirty-three countries or provinces scored significantly lower than Québec. The OECD average was 500, with a standard error of 0.6.

The averages and confidence intervals by province and country for the overall mathematics scores are shown in Figure 1 below and in Table 1 in Appendix 1.

# Figure 1

## Average scores and confidence intervals by province and country: Overall mathematics scale




Note: The OECD average was 500, with a standard error of 0.6. The confidence interval is a range of scores within which the score for the full population is likely to fall in 95% of the cases, or 19 times out of 20. Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps. For example, countries performing about the same as Canada have a confidence interval for the average score that overlaps with that of Canada.

Source: OECD, *Programme for International Student Assessment, 2003.*

## 1.3 Results for each component of the mathematics test

### 1.3.1 Mathematics – Space and shape

This component, which is based on the subject of geometry, relates to spatial and geometric phenomena and relationships. Understanding them requires looking for similarities and differences when analyzing the components of form. It also requires recognizing shapes in different representations and different dimensions, while being aware of the properties of objects and their relative positions.

For this test component, Québec students ranked eighth among the countries and second among the provinces. Only students from Hong Kong-China, Japan and Korea performed significantly better than Québec students.

**Table 1**

| Average scores and confidence intervals for selected provinces and countries | | | | |
|---|---|---|---|---|
| **Mathematics – Space and shape** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Hong Kong-China | 558 | (4.8) | 549 | 568 |
| Japan | 553 | (4.3) | 545 | 562 |
| Korea | 552 | (3.8) | 544 | 559 |
| Switzerland | 540 | (3.5) | 533 | 546 |
| Finland | 539 | (2.0) | 535 | 543 |
| Liechtenstein | 538 | (4.6) | 529 | 547 |
| Alberta | 534 | (4.3) | 526 | 543 |
| Belgium | 530 | (2.3) | 525 | 534 |
| Macau-China | 528 | (3.3) | 521 | 534 |
| **Québec** | **528** | **(4.5)** | **519** | **537** |
| Czech Republic | 527 | (4.1) | 519 | 535 |
| Netherlands | 526 | (2.9) | 521 | 532 |
| New Zealand | 525 | (2.3) | 520 | 530 |
| British Columbia | 523 | (2.6) | 517 | 528 |
| Australia | 521 | (2.3) | 516 | 525 |
| **Canada** | **518** | **(1.8)** | **514** | **521** |
| **…** | **…** | **…** | **…** | **…** |
| **OECD** | **496** | **(0.7)** | | |

Source: OECD, *Programme for International Student Assessment, 2003.*

### 1.3.2 Mathematics – Change and relationships

This subdomain encompasses the mathematical manifestations of change, and the functional relationships and interdependence among variables. Mathematical relationships often take the form of equations or inequalities, but they also include more general relationships such as equivalence, divisibility and inclusion, to name just a few. These relationships may appear in different ways, including symbolic, algebraic, graphical, tabular and geometrical representations. Since these different representations may serve different purposes and have different properties, converting one representation to another often plays a critical role in the way in which we deal with situations and tasks.

In this part of the test, Québec students ranked sixth among the countries and third among the provinces. No country or province performed significantly better than Québec.

**Table 2**

| **Average scores and confidence intervals for selected provinces and countries** | | | | |
|---|---|---|---|---|
| **Mathematics – Change and relationships** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Alberta | 554 | (4.4) | 546 | 563 |
| Netherlands | 551 | (3.1) | 545 | 558 |
| Korea | 548 | (3.5) | 541 | 554 |
| British Columbia | 543 | (2.5) | 538 | 548 |
| Finland | 543 | (2.2) | 539 | 547 |
| Hong Kong-China | 540 | (4.7) | 531 | 549 |
| Liechtenstein | 540 | (3.7) | 532 | 547 |
| **Québec** | **538** | **(5.0)** | **528** | **547** |
| **Canada** | **537** | **(1.9)** | **533** | **540** |
| **...** | **…** | **…** | **…** | **…** |
| **OECD** | **499** | **(0.7)** | | |

Source: OECD, *Programme for International Student Assessment*, 2003.

### 1.3.3 Mathematics – Quantity

This subdomain encompasses numerical phenomena as well as quantitative relationships and profiles. It covers aspects such as understanding the concept of relative size, recognizing numerical patterns and using numbers to represent quantities and quantifiable attributes of real-world objects (counts and measures). This subdomain also includes processing and understanding numbers in the different forms they may take. Another important aspect is *quantitative reasoning*. This requires number sense, along with the ability to represent numbers in various ways, to understand the meaning of these operations and to do mental arithmetic and make estimations. Arithmetic is the branch of mathematics most commonly associated with this subdomain.

For this test component, Québec students ranked seventh among the countries and third among the provinces. Only students from Finland performed significantly better than Québec students.

**Table 3**

| **Average scores and confidence intervals for selected provinces and countries** | | | | |
|---|---|---|---|---|
| **Mathematics – Quantity** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Finland | 549 | (1.8) | 545 | 552 |
| Hong Kong-China | 545 | (4.2) | 537 | 553 |
| Alberta | 545 | (4.0) | 537 | 553 |
| Korea | 537 | (3.0) | 531 | 543 |
| Liechtenstein | 534 | (4.1) | 525 | 542 |
| British Columbia | 533 | (2.3) | 528 | 538 |
| Macau-China | 533 | (3.0) | 527 | 539 |
| Switzerland | 533 | (3.1) | 527 | 539 |
| **Québec** | **531** | **(4.7)** | **522** | **541** |
| Belgium | 530 | (2.3) | 525 | 534 |
| Netherlands | 528 | (3.1) | 522 | 534 |
| **Canada** | **528** | **(1.8)** | **524** | **532** |
| **…** | **…** | **…** | **…** | **…** |
| **OECD** | **501** | **(0.6)** | | |

Source: OECD, *Programme for International Student Assessment*, 2003.

### 1.3.4 Mathematics – Uncertainty

This subdomain deals with probabilistic and statistical phenomena and relationships, which are becoming increasingly important in today's information societies. These phenomena are studied mathematically in probability and in statistics.

For this section of the test, Québec students ranked fourth among the countries and third among the provinces. No country or province performed significantly better than Québec.

**Table 4**

| Average scores and confidence intervals for selected provinces and countries | | | | |
|---|---|---|---|---|
| **Mathematics – Uncertainty** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Hong Kong-China | 558 | (4.6) | 549 | 567 |
| Alberta | 556 | (4.4) | 547 | 565 |
| British Columbia | 550 | (2.4) | 545 | 555 |
| Netherlands | 549 | (3.0) | 543 | 555 |
| Finland | 545 | (2.1) | 541 | 549 |
| **Québec** | **542** | **(4.8)** | **533** | **552** |
| **Canada** | **542** | **(1.8)** | **538** | **545** |
| **…** | **…** | **…** | **…** | **…** |
| **OECD** | **502** | **(0.6)** | | |

Source: OECD, *Programme for International Student Assessment*, 2003.

## 1.4 Levels of mathematical proficiency

Mathematical proficiency is divided into six levels. To reach a given level, students must be able to correctly answer most of the questions corresponding to that level. Consequently, students at a given level are assumed to be capable of providing correct answers to the questions corresponding to all the lower levels. For ease of interpretation, these levels are related to specific score ranges on the overall scale.

Table 5 shows the percentage of students who performed at each level. The countries and provinces listed in the table performed better than Québec at levels 5 and 6. The average for OECD countries was about 15%, or 5 points lower than Canada's recorded average. Four countries (Hong Kong-China, Belgium, Liechtenstein and the Netherlands) had a significantly greater proportion of stronger students in mathematics than Canada. In Québec, the proportion of students at the highest levels was comparable to that for Canada as a whole.

## Table 5

| Overall mathematics scales | | | | | | |
|---|---|---|---|---|---|---|
| **Percentage of students at each level** | | | | | | |
| | Level 1 (359–420) | Level 2 (421–482) | Level 3 (483–544) | Level 4 (545–606) | Level 5 (607–668) | Level 6 (> 668) |
| Hong Kong-China | 6.5 (0.6) | 13.9 (1.0) | 20.0 (1.2) | 25.0 (1.2) | 20.2 (1.0) | 10.5 (0.9) |
| Belgium | 9.3 (0.5) | 15.9 (0.6) | 20.1 (0.7) | 21.0 (0.6) | 17.5 (0.7) | 9.0 (0.5) |
| Alberta | 5.7 (0.8) | 15.0 (2.1) | 24.6 (1.4) | 26.0 (1.7) | 18.5 (1.1) | 8.5 (1.4) |
| Korea | 7.1 (0.7) | 16.6 (0.8) | 24.1 (1.0) | 25.0 (1.1) | 16.7 (0.8) | 8.1 (0.9) |
| Liechtenstein | 7.5 (1.7) | 17.3 (2.8) | 21.6 (2.5) | 23.2 (3.1) | 18.3 (3.2) | 7.3 (1.7) |
| Netherlands | 8.4 (0.9) | 18.0 (1.1) | 23.0 (1.1) | 22.6 (1.3) | 18.2 (1.1) | 7.3 (0.6) |
| **QUÉBEC** | **7.8 (0.9)** | **16.2 (1.3)** | **23.5 (1.5)** | **25.6 (1.5)** | **16.6 (1.2)** | **7.0 (0.8)** |
| **CANADA** | **7.7 (0.4)** | **18.3 (0.6)** | **26.2 (0.7)** | **25.1 (0.6)** | **14.8 (0.5)** | **5.5 (0.4)** |
| Rank: Québec/country | | | | **4/50** | **8/50** | **8/50** |
| Rank: Québec/province | | | | **3/10** | **2/10** | **2/10** |
| **OECD** | **13.2 (0.2)** | **21.1 (0.1)** | **23.7 (0.2)** | **19.1 (0.2)** | **10.6 (0.1)** | **4.0 (0.1)** |

Source: OECD, *Programme for International Student Assessment*, 2003.

## 1.5 Comparison of the boys' and the girls' results

In PISA 2003, boys achieved significantly better results than girls on the overall mathematics scale in 34 participating countries, including Canada. In Canada, boys outperformed girls by 11 points, on average, which corresponds to the mean deviation for OECD countries (13 points). In 15 countries, no differences were observed between boys and girls, while in one other country, girls scored significantly higher than boys (see Table 8 in Appendix 2). However, no significant differences were observed in Québec.

For the four subdomains, differences to varying degrees were observed between boys and girls in Canada's provinces. Boys outperformed girls in the subdomains of space and shape and uncertainty in eight provinces, whereas no differences were observed across the provinces for the quantity subdomain. As for the change and relationships subdomain, boys performed significantly better than girls in seven provinces.

**Table 6**

| Average scores by sex: Canada and Québec | | | | | | |
|---|---|---|---|---|---|---|
| **Scales** | **Girls** | | **Boys** | | **Difference (boys and girls)** | |
| | Average | Standard error | Average | Standard error | Average difference | Standard error |
| Overall (Canada) | 530 | (1.9) | 541 | (2.1) | **11** | (2.1) |
| Overall (Québec) | 534 | (4.7) | 541 | (5.7) | 7 | (4.6) |
| Overall (OECD) | 496 | (0.8) | 508 | (0.7) | **13** | (0.8) |
| Space and shape (Canada) | 511 | (2.2) | 530 | (2.1) | **20** | (2.5) |
| Space and shape (Québec) | 522 | (4.5) | 535 | (5.6) | **14** | (4.9) |
| Space and shape (OECD) | 488 | (0.8) | 505 | (0.8) | **17** | (0.9) |
| Change (Canada) | 532 | (2.0) | 546 | (2.2) | **13** | (2.3) |
| Change (Québec) | 534 | (4.9) | 542 | (6.0) | 8 | (4.7) |
| Change (OECD) | 493 | (0.8) | 504 | (0.8) | **11** | (0.9) |
| Uncertainty (Canada) | 538 | (1.9) | 551 | (2.2) | **13** | (2.3) |
| Uncertainty (Québec) | 538 | (4.6) | 547 | (5.9) | **9** | (4.4) |
| Uncertainty (OECD) | 496 | (0.8) | 508 | (0.7) | **13** | (0.8) |
| Quantity (Canada) | 528 | (1.9) | 533 | (2.2) | **5** | (2.2) |
| Quantity (Québec) | 531 | (4.6) | 532 | (5.7) | 1 | (4.5) |
| Quantity (OECD) | 498 | (0.8) | 504 | (0.8) | **6** | (0.8) |

Note: Significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## 1.6 Comparison of anglophone and francophone students' results

In Québec, there were no statistically significant differences in the scores of francophone and anglophone students.

**Table 7**

| Mathematics averages by language of the school system: Québec | | | | |
|---|---|---|---|---|
| **Scales** | **English-language school system** | | **French-language school system** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Overall | 541 | 531–551 | 536 | 526–546 |
| Space and shape | 526 | 516–536 | 528 | 519–537 |
| Change | 543 | 532–554 | 536 | 526–546 |
| Uncertainty | 547 | 537–557 | 541 | 531–551 |
| Quantity | 535 | 524–546 | 530 | 520–540 |

Source: OECD, *Programme for International Student Assessment*, 2003.

## 1.7 Comparison with PISA 2000

Given that different content was assessed in the mathematics tests administered in PISA 2000 and PISA 2003, it would not be appropriate to compare the overall mathematics scores observed for these two tests. However, it is possible to determine the variations in the scores achieved in two of the subdomains (space and shape; change and relationships) covered in both cycles.

In Québec, there were no statistically significant differences between the PISA 2000 and PISA 2003 scores.

**Table 8**

| Comparison of average mathematics scores: PISA 2000 and PISA 2003 | | | | |
|---|---|---|---|---|
| **Scales** | **PISA 2000** | | **PISA 2003** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Space and shape (Canada) | 515 | 512–518 | 518 | 514–522 |
| Space and shape (Québec) | 536 | 531–541 | 528 | 519–537 |
| Space and shape (OECD) | 494 | 493–495 | 496 | 495–498 |
| Change (Canada) | **520** | 517–523 | **537** | 533–541 |
| Change (Québec) | 529 | 524–534 | 538 | 528–548 |
| Change (OECD) | **488** | 487–490 | **499** | 497–500 |

Note: Statistically significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## 1.8 Relationship of students' engagement, learning and performance in mathematics

Students' level of engagement in mathematics is an important factor for acquiring skills and knowledge. Students who are actively involved in their learning tend to learn more and to be more receptive to acquiring knowledge. Furthermore, students' engagement in mathematics has an impact on their choice of courses, educational paths and career aspirations.

### 1.8.1 Engagement in mathematics

Québec students firmly believe in the **usefulness of mathematics** for their studies and future careers. They are as interested in mathematics as the students in the other OECD countries and enjoy it just as much. Québec students are more convinced of the usefulness of this subject for their studies and future careers. In Canada, they are in the lead in this respect.

Québec students are apparently more confident of their **ability to succeed** in mathematics, compared with students from the other OECD countries. Canadian students have higher than average confidence in their ability to solve precise mathematical problems, and they score above average in terms of how they perceive their ability to learn mathematics.

Québec students are slightly **less anxious** about learning mathematics than their counterparts in the other OECD countries. Emotional stress triggered by studying mathematics can lead to avoidance reactions and hinder learning.

Québec students who reported **a high level of engagement** in mathematics achieved higher scores in this subject. The better students succeed in mathematics, the more they tend to believe in their ability to succeed. The more students believe in their ability to succeed, the greater their commitment to learning mathematics. Not surprisingly, there appears to be a close relationship between mathematics performance and the various measures for gauging students' commitment to this subject. Canadian students who reported a high level of confidence in their mathematics skills scored 133 more points than students who expressed less confidence. This gap spans two levels of mathematics proficiency.

Québec boys and girls apparently do not share the **same level of engagement** in mathematics. Disparities were observed between them in that respect. Girls are less likely to believe that mathematics is useful for their studies and career prospects. They tend to be less interested in mathematics and report that they enjoy this subject less.

## Part 2: Students' reading achievements

### 2.1 Assessment context

This section presents the PISA 2003 overall reading scores. This assessment is less comprehensive than the mathematics assessment, given that mathematics was the major domain in PISA 2003. As a result, this report provides only an overview of students' overall reading achievements. Reading was the major domain assessed in PISA 2000, while PISA 2006 will focus on science.

International experts acknowledge that emphasis should be placed on the acquisition of functional knowledge and skills enabling people to be actively involved in society, and therefore define **reading literacy** (subsequently referred to as **reading**) as:

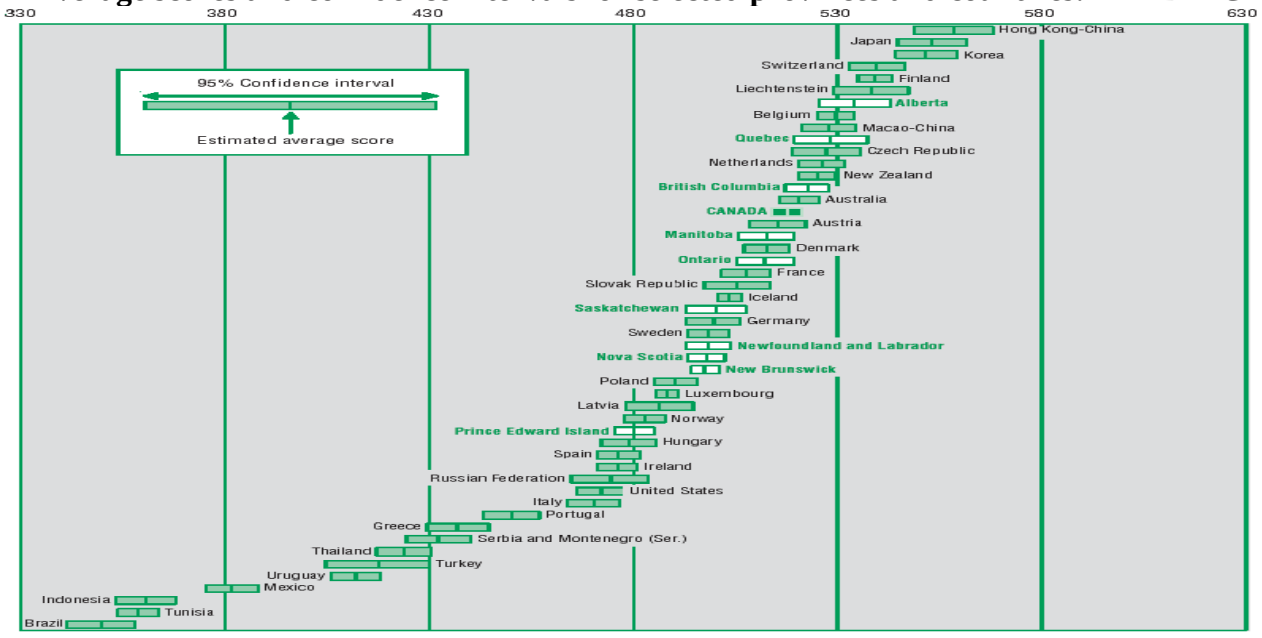
> *An individual's capacity to understand, use and reflect on written texts, in order to achieve one's goals, to develop one's knowledge and potential and to participate in society.*

### 2.2 Québec students' results in reading

Québec students ranked fourth among the participating countries and also fourth among the provinces. Only Finland and Alberta performed significantly better than Québec. Thirty-two countries or provinces scored significantly lower than Québec. The PISA 2003 reading scores confirm those observed in 2000 when reading was the major assessment domain.

The average scores and confidence intervals by province and country for the overall reading scores are shown in Figure 2 below and in Table 12 in Appendix 3.

**Figure 2**
**Average scores and confidence intervals for selected provinces and countries: READING**




**Source: OECD, *Programme for International Student Assessment*, 2003.**

## 2.3 Comparison of the boys' and the girls' results

In Québec, girls significantly outperformed boys on the reading test. This trend is clearly apparent in almost all the countries. In PISA 2000 as in PISA 2003, girls scored significantly higher than boys on the reading test in all but one of the countries and in all the Canadian provinces. The gap between boys and girls is noticeably more pronounced in reading than in mathematics. In Canada, while boys outperformed girls by 11 points in mathematics, girls surpassed them by 32 points in reading.

**Table 9**

| Average scores by sex: Canada and Québec | | | | | | |
|---|---|---|---|---|---|---|
| | **Girls** | | **Boys** | | **Difference (boys and girls)** | |
| | Average | Standard error | Average | Standard error | Average difference | Standard error |
| Overall (Canada) | 546 | (1.8) | 514 | (2.0) | **-32** | (2.0) |
| Overall (Québec) | 542 | (4.2) | 508 | (5.5) | **-34** | (4.6) |
| Overall (OECD) | 511 | (0.7) | 477 | (0.7) | **-34** | (0.8) |

Note: Significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## 2.4 Comparison of anglophone and francophone students' results

In Québec, anglophone students performed better on the reading test than their francophone counterparts, but with no significant difference. In the other provinces, the reverse is true for students in the minority-language school system.

**Table 10**

| Average reading scores by province and language of instruction | | | | |
|---|---|---|---|---|
| **Provinces** | **English-language school system** | | **French-language school system** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Nova Scotia | **514** | 509–519 | **467** | 453–481 |
| New Brunswick | **510** | 506–514 | **485** | 479–491 |
| Québec | 530 | 520–540 | 524 | 515–533 |
| Ontario | **531** | 524–538 | **495** | 485–505 |
| Manitoba | **521** | 514–528 | **494** | 482–506 |

Note: Statistically significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## 2.5 Comparison with PISA 2000

In Québec, the difference between the PISA 2000 and the PISA 2003 results is not statistically significant. In 16 countries and in Canada, average reading scores did not vary measurably from 2000 to 2003. Average scores rose in 15 countries but fell in 10 countries, for which comparable data were available.

**Table 11**

| Comparison of average reading scores: PISA 2000 and PISA 2003 | | | | |
|---|---|---|---|---|
| **Provinces** | **PISA 2000** | | **PISA 2003** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Canada | 534 | 531–537 | 528 | 525–531 |
| Newfoundland and Labrador | 517 | 512–522 | 521 | 515–527 |
| Prince Edward Island | **517** | 512–522 | **495** | 490–499 |
| Nova Scotia | 521 | 516–526 | 513 | 508–517 |
| New Brunswick | 501 | 497–505 | 503 | 499–507 |
| Québec | 536 | 530–542 | 525 | 517–534 |
| Ontario | 533 | 527–539 | 530 | 523–536 |
| Manitoba | 529 | 522–536 | 520 | 514–527 |
| Saskatchewan | **529** | 524–534 | **512** | 504–520 |
| Alberta | 550 | 544–556 | 543 | 535–551 |
| British Columbia | 538 | 532–544 | 535 | 530–540 |

Note: Statistically significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## Part 3: Students' science achievements

### 3.1 Assessment context

This section presents the PISA 2003 overall science scores. This assessment is less comprehensive than the mathematics assessment, given that mathematics was the major domain in PISA 2003. As a result, this section provides only an overview of the students' overall science performance. Science will be the major domain assessed in PISA 2006.

International experts acknowledge that emphasis should be placed on the acquisition of functional knowledge and skills enabling people to be actively involved in society, and therefore define **scientific literacy** (subsequently referred to as **science**) as:

> *The capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.*

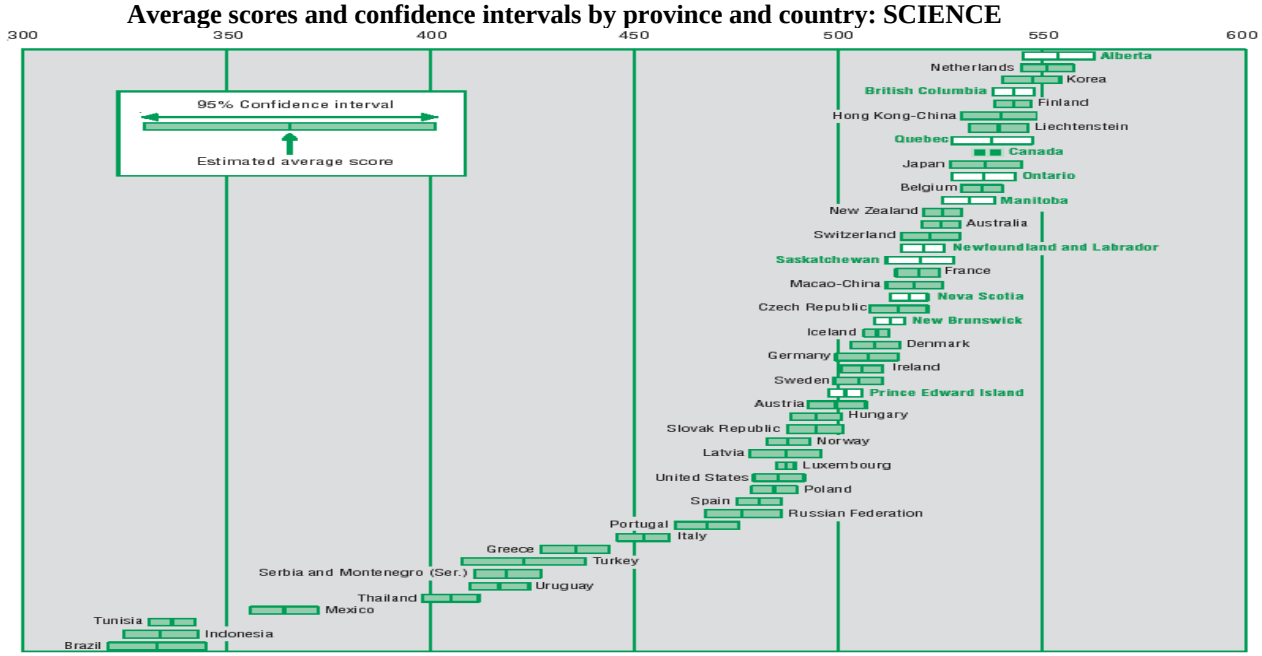
### 3.2 Québec students' science results

Québec students ranked eleventh among the participating countries and third among the provinces. Only Finland, Japan, Hong Kong-China and Korea performed significantly better than Québec. Twenty-six countries or provinces scored significantly lower than Québec.

The averages and confidence intervals by province and country for the overall science scores are shown in Figure 3 below and in Table 16 in Appendix 4.

**Figure 3**

**Average scores and confidence intervals by province and country: SCIENCE**




Source: OECD, *Programme for International Student Assessment*, 2000.

## 3.3 Comparison of the boys' and the girls' results

There was no significant difference between the girls' and the boys' science scores in Québec and in several other participating jurisdictions.

**Table 12**

| Average scores by sex: Canada and Québec | | | | | | |
|---|---|---|---|---|---|---|
| **Selected provinces** | **Girls** | | **Boys** | | **Difference (boys and girls)** | |
| | Average | Standard error | Average | Standard error | Average difference | Standard error |
| Canada | 516 | (2.2) | 527 | (2.3) | **11** | (2.6) |
| Québec | 516 | (5.2) | 523 | (6.3) | 7 | (4.9) |
| Manitoba | 504 | (4.0) | 521 | (5.2) | **17** | (5.6) |
| Alberta | 535 | (5.1) | 543 | (7.1) | 8 | (5.5) |
| British Columbia | 522 | (3.2) | 532 | (4.0) | 10 | (4.7) |
| Ontario | 510 | (4.1) | 521 | (5.1) | **11** | (4.8) |
| OECD | 497 | (0.8) | 503 | (0.7) | **6** | (0.9) |

Note: Significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## 3.4 Comparison of anglophone and francophone students' results

In Québec, anglophone students performed better on the science test than francophone students, but with no significant difference. In the other provinces, significant differences were observed favouring the English-language school system.

**Table 13**

| Average reading scores by province and language of instruction | | | | |
|---|---|---|---|---|
| **Provinces** | **English-language school system** | | **French-language school system** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Nova Scotia | **506** | 501–511 | **465** | 450–480 |
| New Brunswick | **505** | 501–509 | **480** | 473–487 |
| Québec | 523 | 511–535 | 518 | 507–529 |
| Ontario | **517** | 509–525 | **479** | 469–489 |
| Manitoba | **513** | 506–520 | **490** | 477–503 |

Note: Statistically significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## 3.5 Comparison with PISA 2000

In Québec, the difference between the PISA 2000 and PISA 2003 scores is statistically significant.

**Table 14**

| Comparison of average science scores: PISA 2000 and PISA 2003 | | | | |
|---|---|---|---|---|
| **Provinces** | **PISA 2000** | | **PISA 2003** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Canada | **529** | 526–532 | **519** | 515–523 |
| Newfoundland and Labrador | 516 | 509–523 | 514 | 508–519 |
| Prince Edward Island | **508** | 503–513 | **489** | 484–494 |
| Nova Scotia | 516 | 510–522 | 505 | 501–510 |
| New Brunswick | 497 | 492–502 | 498 | 494–502 |
| Québec | **541** | 534–548 | **520** | 510–530 |
| Ontario | 522 | 515–529 | 515 | 508–523 |
| Manitoba | **527** | 520–534 | **512** | 505–519 |
| Saskatchewan | **522** | 516–528 | **506** | 497–515 |
| Alberta | 546 | 539–553 | 539 | 528–550 |
| British Columbia | 533 | 527–539 | 527 | 521–532 |

Note: Statistically significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment, 2003.*

## Part 4: Students' problem-solving achievements

### 4.1 Assessment context

This section presents the PISA 2003 overall problem-solving scores. This is the first time that this domain has been assessed in this survey.

International experts acknowledge that emphasis should be placed on the acquisition of functional knowledge and skills enabling people to be actively involved in society, and therefore define **problem-solving skills** (subsequently referred to as **problem solving**) as:

> *An individual's capacity to use cognitive processes to confront and resolve real, cross-disciplinary situations where the solution path is not immediately obvious and where the literacy domains or curricular areas that might be applicable are not within a single domain of mathematics, science or reading.*

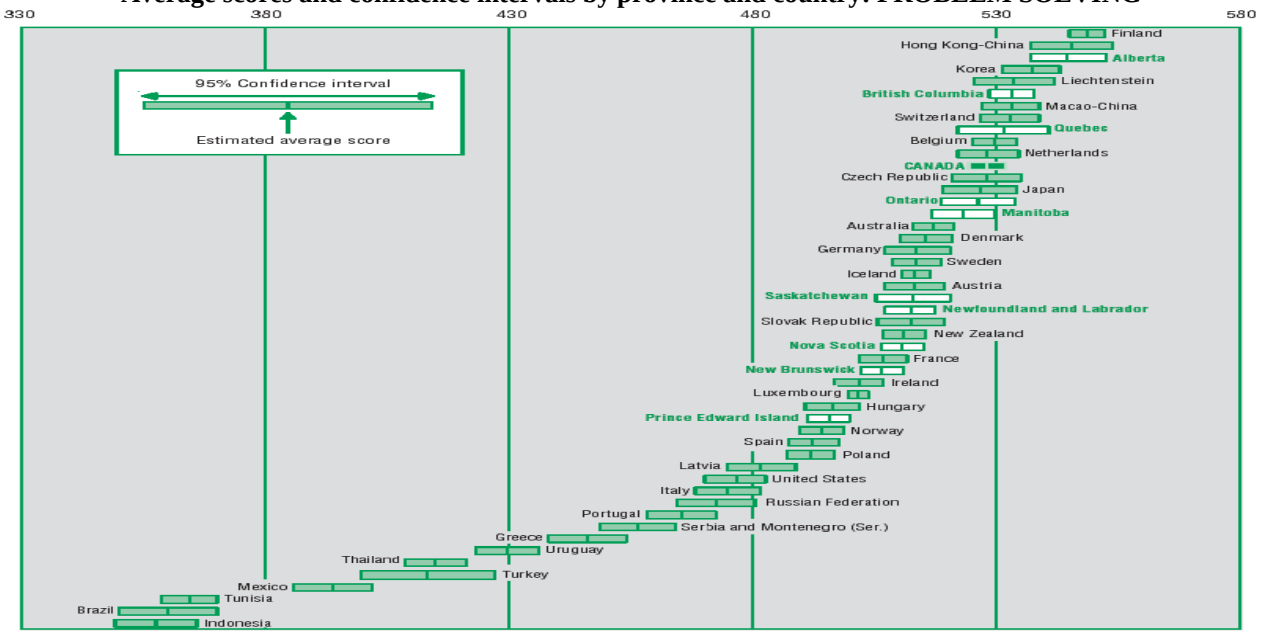
### 4.2 Québec students' problem-solving results

Québec 15-year-olds ranked seventh among the participating countries and third among the provinces. Only Korea, Hong Kong-China, Finland and Alberta performed significantly better than Québec. Thirty countries or provinces scored significantly lower than Québec.

The averages and confidence intervals by province and country for the overall problem-solving scores are shown in Figure 4 below and in Table 20 in Appendix 5.

**Figure 4**

**Average scores and confidence intervals by province and country: PROBLEM SOLVING**




Source: OECD, *Programme for International Student Assessment*, 2003.

## 4.3 Comparison of the boys' and the girls' results

Boys in four countries scored higher than girls in the problem-solving component of the test. In Québec, no difference was observed between the boys and the girls.

## 4.4 Comparison of anglophone and francophone students' results

In Québec, as in Manitoba, anglophone students performed better on the problem-solving test than their francophone counterparts, but with no significant difference. There were significant differences favouring the English-language school system in Nova Scotia, New Brunswick and Ontario.

**Table 15**

| Average scores in problem solving by province and language of instruction | | | | |
|---|---|---|---|---|
| **Provinces** | **English-language school system** | | **French-language school system** | |
| | **Average** | **Confidence interval** | **Average** | **Confidence interval** |
| Nova Scotia | **514** | 509–519 | **493** | 479–507 |
| New Brunswick | **511** | 507–515 | **497** | 491–503 |
| Québec | 538 | 528–548 | 529 | 520–538 |
| Ontario | **528** | 521–535 | **504** | 495–513 |
| Manitoba | 527 | 521–533 | 516 | 504–528 |

Note: Statistically significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

## Conclusion

The OECD *Programme for International Student Assessment* (PISA), which was launched in 2000, compares the achievements of 15-year-old students from Canada and other countries in three domains: mathematics, reading and science. Each assessment made within the framework of PISA takes a more in-depth look at one of the three domains. PISA 2000 dealt mainly with reading, and PISA 2003, with mathematics. Besides covering the secondary themes of reading and science, PISA 2003 also examined students' problem-solving skills.

When the PISA 2000 results were released, there was good news for Canada and Québec—our students' performance ranked among the best. The results in the PISA 2003 report also revealed that 15-year-olds in Canada and Québec achieved high scores in the four assessment domains. Québec students generally placed in the top tier of the countries surveyed.

### Québec students' performance in mathematics ranks high

The students in only two countries (Hong Kong-China and Finland) performed significantly better than Canadian 15-year-olds in mathematics. While Québec students ranked fifth internationally, no country achieved significantly better scores than Québec.

PISA 2003 evaluated four mathematics subdomains: space and shape; change and relationships; quantity; and uncertainty. Québec students scored highest in the uncertainty subdomain. While Québec students ranked fourth internationally in this subdomain, no country performed significantly better. For the space and shape subdomain, students in Québec placed eighth, having been outranked by only three countries. For the change and relationships subdomain, Québec students placed sixth, but they were not significantly outperformed by any country. For the quantity subdomain, Québec students placed seventh, but only one country performed significantly better.

Students' mathematical skills were also described by six levels of competency. Proportionally more Québec students reached the two top levels (levels 5 and 6) than the OECD average.

Because these assessments were administered in both 2002 and 2003, they allow us to compare students' performance in two of the four mathematics subdomains evaluated in both cycles. Findings show that Québec experienced a negligible drop in performance for the space and shape subdomain but also a negligible rise for the change and relationships subdomain.

For certain mathematics subdomains, significant differences were observed between the girls' and the boys' scores. Boys significantly outperformed girls in the uncertainty domain and in the space and shape subdomain.

No significant differences were found between the performances of students in the English-language and French-language school systems in Québec.

**Québec students' achievements in the three secondary domains**

While Québec students placed fourth in reading, only one country (Finland) performed significantly better. In science, Québec students ranked eleventh among the countries, but only four countries recorded significantly higher results (Finland, Japan, Korea and Hong Kong-China). In problem solving, Québec students placed seventh overall, but only three countries achieved significantly better results (Korea, Finland and Hong Kong-China).

There were no significant differences between Québec students' scores in PISA 2000 and PISA 2003.

As in PISA 2000, a relatively sizeable difference was observed favouring Québec girls on the reading test. This difference is significant in all but one of the countries and in all the provinces. The boys' and the girls' science scores were similar to their mathematics scores. In Québec, no significant difference was observed. Furthermore, there was no significant difference between the girls' and the boys' performance in problem solving for Canada and in most of the provinces, including Québec.

For all three secondary domains, no significant differences were observed between the performances of Québec students in the English-language and French-language school systems.

The highly favourable performance of Québec's 15-year-olds deserves applause. Compared overall with the other participating students, Québec's 15-year-olds ranked among the top in PISA 2003. It has been observed, however, that Québec's science scores in PISA 2003 dropped from those recorded in PISA 2000.

We can safely say that the performance of Québec's 15-year-olds in PISA 2003 certainly holds great promise not only for their own futures but also for the future of Québec.

# Appendix 1

**Table 1**

| Average scores and confidence intervals for selected provinces and countries | | | | |
|---|---|---|---|---|
| **OVERALL SCALES IN MATHEMATICS** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Hong Kong-China | 550 | (4.5) | 541 | 559 |
| Alberta | 549 | (4.3) | 540 | 558 |
| Finland | 544 | (1.9) | 541 | 548 |
| Korea | 542 | (3.2) | 536 | 549 |
| British Columbia | 538 | (2.4) | 534 | 543 |
| Netherlands | 538 | (3.1) | 532 | 544 |
| Liechtenstein | 536 | (4.1) | 528 | 544 |
| **Québec** | **537** | **(4.7)** | **528** | **546** |
| Japan | 534 | (4.0) | 526 | 542 |
| **Canada** | **532** | **(1.8)** | **529** | **536** |
| Ontario | 530 | (3.6) | 522 | 537 |
| Belgium | 529 | (2.3) | 525 | 534 |
| Manitoba | 528 | (3.1) | 522 | 534 |
| Macau-China | 527 | (2.9) | 522 | 533 |
| Switzerland | 527 | (3.4) | 520 | 533 |
| Australia | 524 | (2.1) | 520 | 528 |
| New Zealand | 523 | (2.3) | 519 | 528 |
| Newfoundland and Labrador | 517 | (2.5) | 512 | 522 |
| Saskatchewan | 516 | (3.9) | 508 | 524 |
| Czech Republic | 516 | (3.5) | 510 | 523 |
| Nova Scotia | 515 | (2.2) | 511 | 519 |
| Iceland | 515 | (1.4) | 512 | 518 |
| Denmark | 514 | (2.7) | 509 | 520 |
| New Brunswick | 512 | (1.8) | 508 | 515 |
| France | 511 | (2.5) | 506 | 516 |
| Sweden | 509 | (2.6) | 504 | 514 |
| Austria | 506 | (3.3) | 499 | 512 |
| Germany | 503 | (3.3) | 496 | 509 |
| Ireland | 503 | (2.4) | 498 | 508 |
| Prince Edward Island | 500 | (2.0) | 496 | 504 |
| **OECD average** | **500** | **(0.6)** | | |
| Slovak Republic | 498 | (3.3) | 492 | 505 |
| Norway | 495 | (2.4) | 491 | 500 |
| Luxembourg | 493 | (1.0) | 491 | 495 |
| Poland | 490 | (2.5) | 485 | 495 |
| Hungary | 490 | (2.8) | 484 | 496 |
| Spain | 485 | (2.4) | 480 | 490 |
| Latvia | 483 | (3.7) | 476 | 491 |
| United States | 483 | (2.9) | 477 | 489 |
| Russian Federation | 468 | (4.2) | 460 | 477 |
| Portugal | 466 | (3.4) | 459 | 473 |
| Italy | 466 | (3.1) | 460 | 472 |
| Greece | 445 | (3.9) | 437 | 453 |
| Serbia and Montenegro | 437 | (3.8) | 430 | 444 |
| Turkey | 423 | (6.7) | 410 | 437 |
| Uruguay | 422 | (3.3) | 416 | 429 |
| Thailand | 417 | (3.0) | 411 | 423 |
| Mexico | 385 | (3.6) | 378 | 392 |
| Indonesia | 360 | (3.9) | 352 | 368 |
| Tunisia | 359 | (2.5) | 354 | 364 |
| Brazil | 356 | (4.8) | 347 | 365 |

* Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: OECD, *Programme for International Student Assessment*, 2003.

# Appendix 2

**Table 8**

| Averages of provinces and countries, by sex | | | | | | |
|---|---|---|---|---|---|---|
| **OVERALL SCALES IN MATHEMATICS** | | | | | | |
| **Countries and provinces** | **Girls** | | **Boys** | | **(Boys and girls)*** | |
| | Average | Standard error | Average | Standard error | Average difference | Standard error |
| Liechtenstein | 521 | (6.3) | 550 | (7.2) | **29** | (10.9) |
| Korea | 528 | (5.3) | 552 | (4.4) | **23** | (6.8) |
| Macau-China | 517 | (3.3) | 538 | (4.8) | **21** | (5.8) |
| Greece | 436 | (3.8) | 455 | (4.8) | **19** | (3.6) |
| Slovak Republic | 489 | (3.6) | 507 | (3.9) | **19** | (3.7) |
| Italy | 457 | (3.8) | 475 | (4.6) | **18** | (5.9) |
| Luxembourg | 485 | (1.5) | 502 | (1.9) | **17** | (2.8) |
| Switzerland | 518 | (3.6) | 535 | (4.7) | **17** | (4.9) |
| Denmark | 506 | (3.0) | 523 | (3.4) | **17** | (3.2) |
| Brazil | 348 | (4.4) | 365 | (6.1) | **16** | (4.1) |
| Turkey | 415 | (6.7) | 430 | (7.9) | **15** | (6.2) |
| Czech Republic | 509 | (4.4) | 524 | (4.3) | **15** | (5.1) |
| Ireland | 495 | (3.4) | 510 | (3.0) | **15** | (4.2) |
| New Zealand | 516 | (3.2) | 531 | (2.8) | **14** | (3.9) |
| Manitoba | 521 | (3.9) | 535 | (4.1) | **14** | (5.0) |
| Portugal | 460 | (3.4) | 472 | (4.2) | **12** | (3.3) |
| Tunisia | 353 | (2.9) | 365 | (2.7) | **12** | (2.5) |
| Uruguay | 416 | (3.8) | 428 | (4.0) | **12** | (4.2) |
| OECD average | 496 | (0.8) | 508 | (0.7) | **13** | (0.8) |
| Nova Scotia | 509 | (2.9) | 521 | (3.0) | **11** | (3.9) |
| Canada | 530 | (1.9) | 541 | (2.1) | **11** | (2.1) |
| Ontario | 524 | (3.6) | 536 | (4.6) | **11** | (4.0) |
| Mexico | 380 | (4.1) | 391 | (4.3) | **11** | (3.9) |
| Newfoundland and Labrador | 512 | (3.0) | 522 | (3.5) | **10** | (4.2) |
| Russian Federation | 463 | (4.2) | 473 | (5.3) | **10** | (4.4) |
| Alberta | 544 | (4.2) | 554 | (5.3) | **10** | (4.4) |
| Germany | 499 | (3.9) | 508 | (4.0) | **9** | (4.4) |
| Spain | 481 | (2.2) | 490 | (3.4) | **9** | (3.0) |
| France | 507 | (2.9) | 515 | (3.6) | **9** | (4.2) |
| Japan | 530 | (4.0) | 539 | (5.8) | 8 | (5.9) |
| British Columbia | 534 | (2.2) | 542 | (3.4) | **8** | (3.2) |
| Hungary | 486 | (3.3) | 494 | (3.3) | **8** | (3.5) |
| Austria | 502 | (4.0) | 509 | (4.0) | 8 | (4.4) |
| Belgium | 525 | (3.2) | 533 | (3.4) | 8 | (4.8) |
| Finland | 541 | (2.1) | 548 | (2.5) | **7** | (2.7) |
| Québec | 534 | (4.7) | 541 | (5.7) | 7 | (4.6) |
| Sweden | 506 | (3.1) | 512 | (3.0) | **7** | (3.3) |
| United States | 480 | (3.2) | 486 | (3.3) | **6** | (2.9) |
| Norway | 492 | (2.9) | 498 | (2.8) | 6 | (3.2) |
| New Brunswick | 509 | (1.9) | 515 | (2.7) | **6** | (2.9) |
| Poland | 487 | (2.9) | 493 | (3.0) | 6 | (3.1) |
| Australia | 522 | (2.7) | 527 | (3.0) | 5 | (3.8) |
| Netherlands | 535 | (3.5) | 540 | (4.1) | 5 | (4.3) |
| Hong Kong-China | 548 | (4.6) | 552 | (6.5) | 4 | (6.6) |
| Indonesia | 358 | (4.6) | 362 | (3.9) | 3 | (3.4) |
| Latvia | 482 | (3.6) | 485 | (4.8) | 3 | (4.0) |
| Serbia and Montenegro (Ser.) | 436 | (4.5) | 437 | (4.2) | 1 | (4.4) |
| Prince Edward Island | 501 | (2.7) | 500 | (3.3) | -1 | (4.5) |
| Saskatchewan | 518 | (4.2) | 515 | (4.4) | -3 | (3.7) |
| Thailand | 419 | (3.4) | 415 | (4.0) | -4 | (4.2) |
| Iceland | 523 | (2.2) | 508 | (2.3) | **-15** | (3.5) |

Note: Significant differences are shown in bold.
Source: OECD, *Programme for International Student Assessment*, 2003.

# Appendix 3

**Table 12**

| Average scores and confidence intervals for selected provinces and countries | | | | |
|---|---|---|---|---|
| **READING** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Finland | 543 | (1.6) | 540 | 547 |
| Alberta | 543 | (4.3) | 535 | 552 |
| British Columbia | 535 | (2.5) | 531 | 540 |
| Korea | 534 | (3.1) | 528 | 540 |
| Ontario | 530 | (3.5) | 523 | 536 |
| **Canada** | **528** | **(1.7)** | **524** | **531** |
| **Québec** | **525** | **(4.3)** | **517** | **534** |
| Australia | 525 | (2.1) | 521 | 530 |
| Liechtenstein | 525 | (3.6) | 518 | 532 |
| New Zealand | 522 | (2.5) | 517 | 526 |
| Newfoundland and Labrador | 521 | (3.2) | 515 | 527 |
| Manitoba | 520 | (3.3) | 514 | 527 |
| Ireland | 515 | (2.6) | 510 | 521 |
| Sweden | 514 | (2.4) | 510 | 519 |
| Nova Scotia | 513 | (2.3) | 508 | 517 |
| Netherlands | 513 | (2.9) | 508 | 519 |
| Saskatchewan | 512 | (4.2) | 504 | 520 |
| Hong Kong-China | 510 | (3.7) | 502 | 517 |
| Belgium | 507 | (2.6) | 502 | 512 |
| New Brunswick | 503 | (2.1) | 499 | 507 |
| Norway | 500 | (2.8) | 494 | 505 |
| Switzerland | 499 | (3.3) | 493 | 506 |
| Japan | 498 | (3.9) | 490 | 506 |
| Macau-China | 498 | (2.2) | 493 | 502 |
| Poland | 497 | (2.9) | 491 | 502 |
| France | 496 | (2.7) | 491 | 501 |
| United States | 495 | (3.2) | 489 | 501 |
| Prince Edward Island | 495 | (2.3) | 490 | 499 |
| Denmark | 492 | (2.8) | 487 | 498 |
| Iceland | 492 | (1.6) | 489 | 495 |
| Germany | 491 | (3.4) | 485 | 498 |
| Austria | 491 | (3.8) | 483 | 498 |
| Latvia | 491 | (3.7) | 483 | 498 |
| Czech Republic | 489 | (3.5) | 482 | 495 |
| Hungary | 482 | (2.5) | 477 | 487 |
| Spain | 481 | (2.6) | 475 | 486 |
| Luxembourg | 479 | (1.5) | 477 | 482 |
| Portugal | 478 | (3.7) | 470 | 485 |
| Italy | 476 | (3.0) | 470 | 482 |
| Greece | 472 | (4.1) | 464 | 480 |
| Slovak Republic | 469 | (3.1) | 463 | 475 |
| Russian Federation | 442 | (3.9) | 434 | 450 |
| Turkey | 441 | (5.8) | 430 | 452 |
| Uruguay | 434 | (3.4) | 427 | 441 |
| Thailand | 420 | (2.8) | 414 | 425 |
| Serbia and Montenegro | 412 | (3.6) | 405 | 419 |
| Brazil | 403 | (4.6) | 394 | 412 |
| Mexico | 400 | (4.1) | 392 | 408 |
| Indonesia | 382 | (3.4) | 375 | 388 |
| Tunisia | 375 | (2.8) | 369 | 380 |

Note: Results in reading for 2003 are based on the reading comprehension scale developed for PISA 2000. The average was 500 for the 27 countries that took part in this assessment cycle. Nevertheless, because three other OECD countries participated in the PISA 2003 reading test, the overall average for the OECD countries for this cycle was 494, with a standard error of 0.6.
Source: OECD, *Programme for International Student Assessment*, 2003.

# Appendix 4

**Table 16**

| Average scores and confidence intervals for selected provinces and countries | | | | |
|---|---|---|---|---|
| **SCIENCE** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Finland | 548 | (1.9) | 544 | 552 |
| Japan | 548 | (4.1) | 540 | 556 |
| Hong Kong-China | 539 | (4.3) | 531 | 548 |
| Alberta | 539 | (5.6) | 528 | 550 |
| Korea | 538 | (3.5) | 531 | 545 |
| British Columbia | 527 | (2.8) | 521 | 532 |
| Liechtenstein | 525 | (4.3) | 517 | 534 |
| Australia | 525 | (2.1) | 521 | 529 |
| Macau-China | 525 | (3.0) | 519 | 531 |
| Netherlands | 524 | (3.1) | 518 | 531 |
| Czech Republic | 523 | (3.4) | 517 | 530 |
| New Zealand | 521 | (2.4) | 516 | 526 |
| Québec | 520 | (5.2) | 510 | 530 |
| Canada | 519 | (2.0) | 515 | 523 |
| Ontario | 515 | (3.9) | 508 | 523 |
| Newfoundland and Labrador | 514 | (2.9) | 508 | 519 |
| Switzerland | 513 | (3.7) | 506 | 520 |
| Manitoba | 512 | (3.7) | 505 | 519 |
| France | 511 | (3.0) | 505 | 517 |
| Belgium | 509 | (2.5) | 504 | 514 |
| Sweden | 506 | (2.7) | 501 | 511 |
| Saskatchewan | 506 | (4.6) | 497 | 515 |
| Nova Scotia | 505 | (2.4) | 501 | 510 |
| Ireland | 505 | (2.7) | 500 | 511 |
| Hungary | 503 | (2.8) | 498 | 509 |
| Germany | 502 | (3.6) | 495 | 509 |
| **OECD average** | **500** | **(0.6)** | | |
| Poland | 498 | (2.9) | 492 | 503 |
| New Brunswick | 498 | (2.2) | 494 | 502 |
| Slovak Republic | 495 | (3.7) | 488 | 502 |
| Iceland | 495 | (1.5) | 492 | 498 |
| United States | 491 | (3.1) | 485 | 497 |
| Austria | 491 | (3.4) | 484 | 498 |
| Russian Federation | 489 | (4.1) | 481 | 497 |
| Latvia | 489 | (3.9) | 482 | 497 |
| Prince Edward Island | 489 | (2.6) | 484 | 494 |
| Spain | 487 | (2.6) | 482 | 492 |
| Italy | 486 | (3.1) | 480 | 493 |
| Norway | 484 | (2.9) | 479 | 490 |
| Luxembourg | 483 | (1.5) | 480 | 486 |
| Greece | 481 | (3.8) | 474 | 489 |
| Denmark | 475 | (3.0) | 469 | 481 |
| Portugal | 468 | (3.5) | 461 | 475 |
| Uruguay | 438 | (2.9) | 433 | 444 |
| Serbia and Montenegro | 436 | (3.5) | 430 | 443 |
| Turkey | 434 | (5.9) | 423 | 446 |
| Thailand | 429 | (2.7) | 424 | 434 |
| Mexico | 405 | (3.5) | 398 | 412 |
| Indonesia | 395 | (3.2) | 389 | 401 |
| Brazil | 390 | (4.3) | 381 | 398 |
| Tunisia | 385 | (2.6) | 380 | 390 |

* Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: OECD, *Programme for International Student Assessment*, 2003.

# Appendix 5

**Table 20**

| Average scores and confidence intervals for selected provinces and countries | | | | |
|---|---|---|---|---|
| **PROBLEM SOLVING** | | | | |
| | | | **Confidence interval** | |
| **Countries and provinces** | **Average** | **Standard error** | 95% lower limit | 95% upper limit |
| Korea | 550 | (3.1) | 544 | 556 |
| Hong Kong-China | 548 | (4.2) | 540 | 556 |
| Finland | 548 | (1.9) | 544 | 551 |
| Japan | 547 | (4.1) | 539 | 555 |
| Alberta | 546 | (4.3) | 538 | 555 |
| British Columbia | 536 | (2.4) | 532 | 541 |
| New Zealand | 533 | (2.2) | 529 | 537 |
| Macau-China | 532 | (2.5) | 527 | 537 |
| Québec | 531 | (4.3) | 523 | 539 |
| Australia | 530 | (2.0) | 526 | 534 |
| Liechtenstein | 529 | (3.9) | 522 | 537 |
| Canada | 529 | (1.7) | 526 | 533 |
| Ontario | 527 | (3.4) | 520 | 533 |
| Manitoba | 527 | (2.9) | 521 | 533 |
| Switzerland | 521 | (3.0) | 515 | 527 |
| Netherlands | 520 | (3.0) | 514 | 526 |
| France | 519 | (2.7) | 514 | 524 |
| Newfoundland and Labrador | 517 | (3.2) | 511 | 524 |
| Denmark | 517 | (2.5) | 512 | 522 |
| Czech Republic | 516 | (3.4) | 510 | 523 |
| Saskatchewan | 516 | (4.0) | 508 | 524 |
| Nova Scotia | 514 | (2.3) | 510 | 519 |
| Germany | 513 | (3.2) | 507 | 520 |
| Belgium | 510 | (2.4) | 506 | 515 |
| Sweden | 509 | (2.4) | 504 | 513 |
| New Brunswick | 508 | (2.2) | 503 | 512 |
| Austria | 506 | (3.2) | 500 | 512 |
| Iceland | 505 | (1.4) | 502 | 507 |
| Hungary | 501 | (2.9) | 495 | 507 |
| **OECD average** | **500** | **(0.6)** | | |
| Prince Edward Island | 498 | (2.2) | 493 | 502 |
| Ireland | 498 | (2.3) | 494 | 503 |
| Luxembourg | 494 | (1.4) | 491 | 496 |
| Slovak Republic | 492 | (3.4) | 485 | 498 |
| Norway | 490 | (2.6) | 485 | 495 |
| Poland | 487 | (2.8) | 481 | 492 |
| Latvia | 483 | (3.9) | 475 | 490 |
| Spain | 482 | (2.7) | 477 | 488 |
| Russian Federation | 479 | (4.6) | 470 | 488 |
| United States | 477 | (3.1) | 471 | 484 |
| Portugal | 470 | (3.9) | 462 | 477 |
| Italy | 470 | (3.1) | 463 | 476 |
| Greece | 449 | (4.0) | 441 | 456 |
| Thailand | 425 | (2.7) | 420 | 430 |
| Serbia and Montenegro | 420 | (3.3) | 414 | 427 |
| Uruguay | 411 | (3.7) | 403 | 418 |
| Turkey | 408 | (6.0) | 396 | 419 |
| Mexico | 384 | (4.3) | 376 | 393 |
| Brazil | 371 | (4.8) | 361 | 380 |
| Indonesia | 361 | (3.3) | 355 | 368 |
| Tunisia | 345 | (2.1) | 341 | 349 |

* Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: OECD, *Programme for International Student Assessment*, 2003.

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