

Context Statement

Social Context

New Brunswick's population as of July 1, 2001, was 757,077. Serving Canada's only officially bilingual province, the New Brunswick public education system plays an important role in offering students the opportunity to learn in both French and English. The province's dual system provides a full curriculum and services in both official languages.

The Department of Education has made a considerable effort to develop a school system that will meet the needs of all students. It has put in place programs to reduce school-leaving by identifying potential dropouts, to enable physically challenged students to attend school, and to facilitate the integration into the school system of as many students as possible. As a result, the province has high rates of retention (students who stay in school) within an education system that is committed to the principles of inclusion for students with special needs.

Organization of the School System

Since 1967, the provincial government has had sole responsibility for financing public schools and is committed to equal opportunity for all students. The minister of education has the authority to pre-scribe curriculum and establishes educational goals and standards.

In 1969, the province of New Brunswick became officially bilingual. In 1974, in recognition of its linguistic duality, the province established two parallel but separate education systems. Each linguistic sector of the Department of Education is responsible for its own curriculum and assessment.

The public education governance structure in New Brunswick has undergone major changes in the past decade. In 1996, school boards were dissolved. Between 1996 and 2001, the province's 18 school district offices (organized in eight administrative units) held responsibility for the operation of the schools. A network of parental governance structures established at the school, district, and provincial levels was responsible for advising on, monitoring, and providing approval for those matters pertaining to the province's educational direction.

The governance structure underwent major reforms in 2001. The number of school districts was reduced to 14 independently administered units — five French and nine English school districts. District Education Councils (DECs) were created, consisting of publicly and locally elected members. DECs are responsible for establishing the direction and priorities for the school district and for making decisions as to how the district and schools are operated. The DECs have broad policy and planning responsibilities and are ultimately responsible to the community for the performance of the schools and for meeting provincial standards.

Kindergarten through grade 12 enrolment for the 2000–01 school year totalled 124,942 (86,555 students in the anglophone sector and 38,387 students in the francophone sector). The starting age for school is 5, and attendance is mandatory until age 18 (increased from 16 as of July 1, 1999). Students attend classes for 187 days per year.

Mathematics Teaching

Mathematics teaching is currently undergoing a significant transition at all levels, with emphasis being placed on “student-active” instruction. Curriculum and instruction are focused on four main areas: mathematical problem solving, mathematical reasoning, communication in mathematics, and mathematical connections. Curriculum and resources are being developed to emphasize the relevance of mathematics and to highlight its relationship to today's technology.

New curriculum and related resources have been implemented throughout the province from K to 10, with extensive professional development being provided to support their implementation. Curriculum development and piloting are under way at grades 11 and 12, with official implementation to take place in the future.

Mathematics Assessment

The Department of Education administers a comprehensive Provincial Evaluation Program to monitor student achievement at particular points in the system. This provides important feedback at provincial, local, and individual levels about the knowledge and skills students are expected to learn.

Currently, annual assessments are administered at grades 3 and 5, testing outcomes identified in the provincial mathematics, science, and language arts curriculum documents. These are designed as program assessments with a focus on reporting group data in terms of whether or not expectations have been met.

The Middle Level Mathematics Assessment, based on the new curriculum implemented in the fall of 1999, has been administered to all grade 8 students since June 2000. This assessment is based on grade 8 outcomes, but is viewed more comprehensively as an assessment of student achievement at the end of middle school (grades 6, 7, and 8).

Since 1993, the Department of Education has administered a provincial examination in mathematics at the grade 11 level, which accounts for 30% of a student's final mark.

Results for New Brunswick (English)

Mathematics Content

There were significant differences at levels 1, 2, and 3 between the performance of New Brunswick 13-year-old students who responded in English and the Canadian average. For 16-year-old students, there were significant differences at levels 3 and 4. Otherwise, New Brunswick (English) students performed as well as the Canadian average.

There were slightly fewer 13-year-old students at level 1; otherwise, there were no significant changes in performance for either age group between the 1997 assessment and that of 2001.

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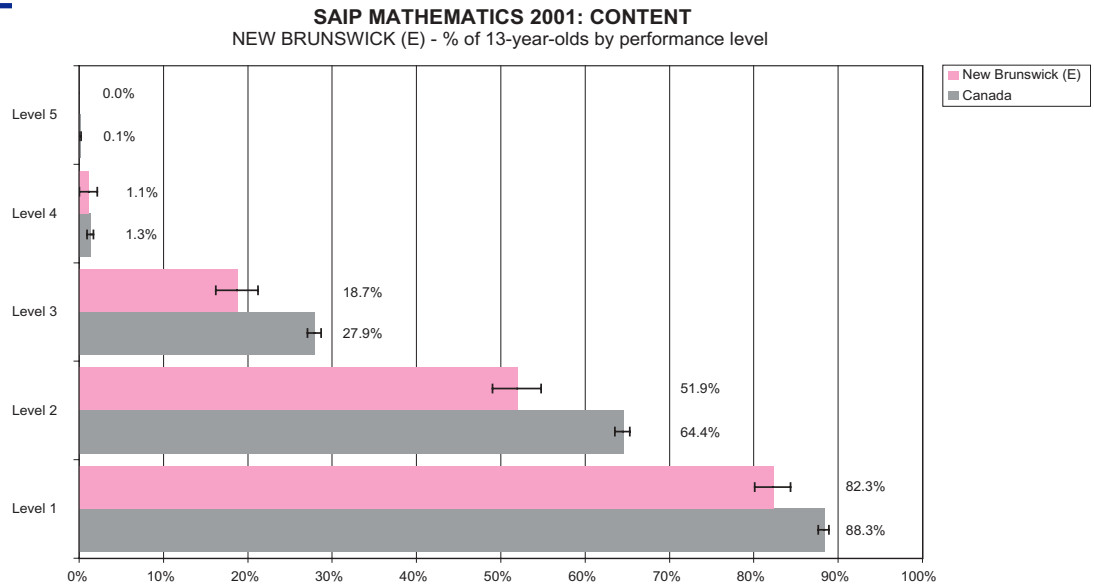
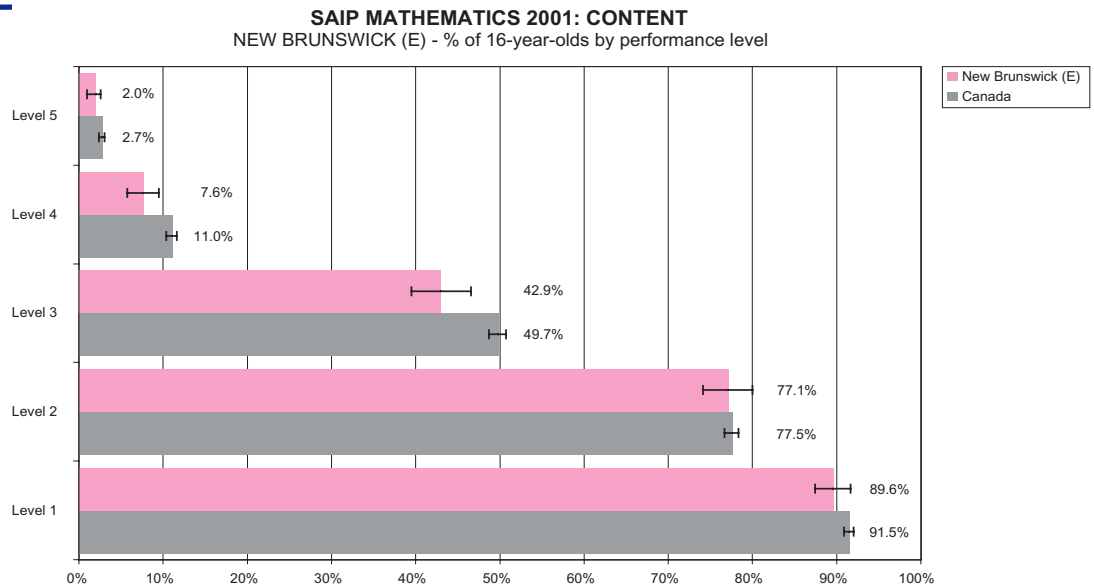


CHART NB(E)2



Problem Solving

There were significant differences at all levels, except level 5, between the performance of New Brunswick 13-year-old students who responded in English and the Canadian average. For 16-year-old students, there were differences at levels 3 and 4.

Since the 1997 assessment, the proportion of New Brunswick English-language 13-year-old students reaching levels 2 and 3 has increased. For 16-year-old students, the proportion has increased at levels 2, 3, and 5.

CHART NB(E)3

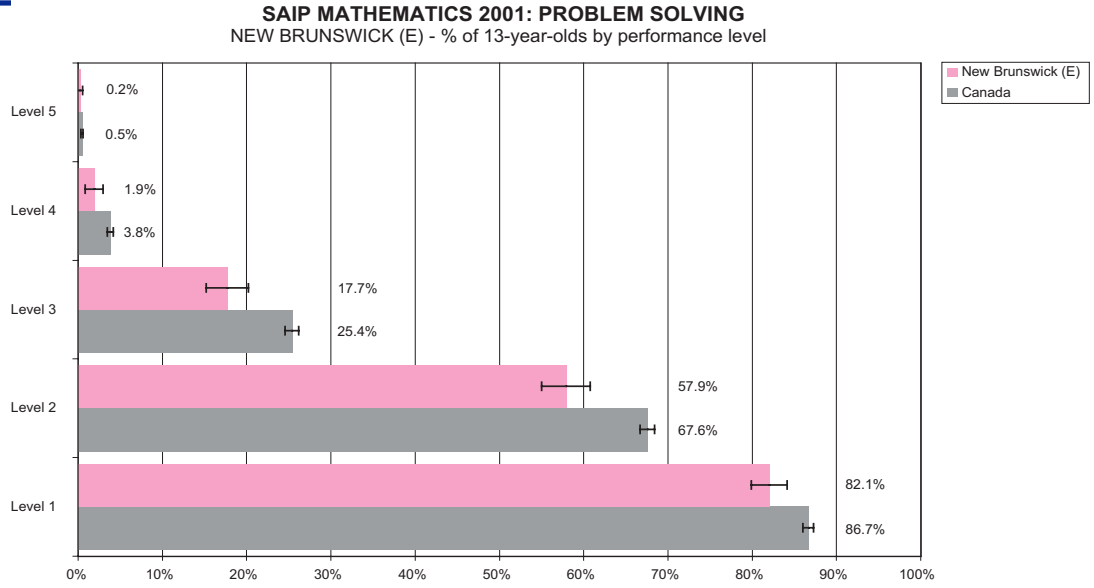
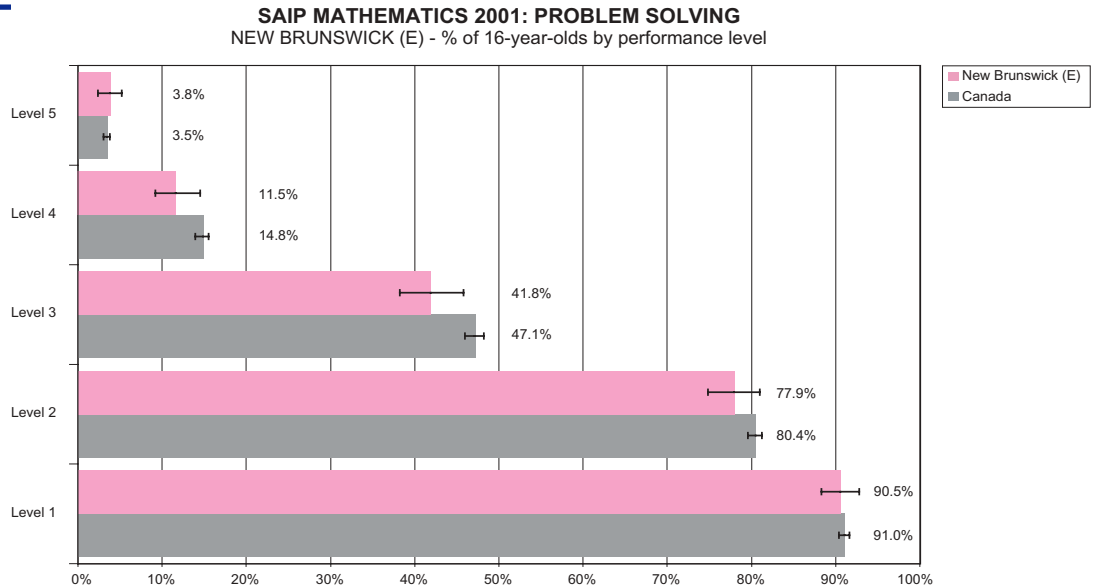


CHART NB(E)4



Context Statement

Social Context

Socioeconomic development has improved in New Brunswick over the past few years. In spite of this trend, the unemployment rate is higher than the Canadian average, especially in the francophone regions of the province. As of July 1, 2001, New Brunswick's population was 757,077. The average unemployment rate for 2000 was 10%, versus a Canadian rate of 6.8%. For 2000, New Brunswick reported a participation rate of 61.6% among residents 15 years old and over (work force over population of working age), and an employment to population ratio of 55.4%. Rural residents make up 51.2% of the population and urban residents 48.8%.

New Brunswick has been officially bilingual since 1969. More than one-third of its population is of French descent. School enrolment is 124,942 students, of whom 30.7% attend francophone schools. Almost half of students enrolled in francophone schools live in a majority anglophone environment.

Organization of the School System

The New Brunswick school system begins in kindergarten and continues to grade 12. Children are enrolled in kindergarten in the calendar year in which they reach the age of 5. School attendance is compulsory until the end of secondary schooling or age 18.

In 1974, the province created an educational system composed of two parallel and distinct divisions, one for each linguistic community. The francophone section of the Department of Education is responsible for providing curriculum and assessment that respond to the needs of the francophone population. The province is divided into five francophone school districts with 38,387 students and nine anglophone school districts with 86,555 students.

In recent years, considerable efforts have been made to respond to the particular needs of students and to make school accessible to all. In accordance with the New Brunswick *Education Act* and regulations, school administrators are required to place students with special needs in regular classrooms, providing that the educational requirements of all students are considered. Moreover, early detection programs have been put in place to discourage school-leaving. This has resulted in one of the lowest school dropout rates in Canada: for the 1999–2000 school year, francophone schools recorded a dropout rate of 3.1%.

There is no provincial directive covering achievement levels from grades 1 to 8. In grades 9, 10, 11, and 12, the minimum passing grade for credit is 55%. Since 1991, provincial secondary school examinations are given to all students at the end of their studies and count for 40% of their final grade in seven required subjects, including mathematics in grade 11.

Mathematics Teaching

Mathematics is a core subject in New Brunswick schools. Mathematics courses are compulsory in the province for all students from kindergarten to grade 11. By age 13, a student has received (starting as early as the first year of schooling) approximately 1,300 hours of mathematics education, with an additional 500 hours by age 16. In secondary school (grades 9 to 12), francophone students are required to obtain four mathematics credits to receive a secondary diploma.

The aims of mathematics courses are to help students

- learn to value mathematics
- acquire confidence in their mathematics skills
- become empowered to solve problems
- learn to communicate mathematically
- learn to reason mathematically

These aims are attained through mathematics content that includes algebra, measurement, statistics and probability, transformational geometry, Euclidian geometry, analytical geometry, linear programming, vectors and matrices, sequences and series, trigonometry and financial mathematics.

Assessment of Mathematics Achievement

At the provincial level, the francophone sector of the Department of Education has administered since 1991 a grade 11 mathematics examination, at the end of the last required course in this subject at the secondary level. Results of this examination, which make up 40% of the student's final mark, are provided to the school within five days following administration. The examination includes both multiple-choice and essay-type questions and covers the essential dimensions of the curriculum including problem solving. A detailed statistical report is later provided to school districts and schools.

The participation of teachers is essential at every stage of development, administration, and marking of the examinations. Such participation is very helpful to teachers in their own mathematics assessment practices.

In 1993, a formative assessment program for mathematics was put in place at the elementary level. Assessments are administered in September of each year to students in grades 4 and 8. Assessment results provide indicators of students' strengths and weaknesses, very early in the school year. This information is intended for teachers and parents but is also helpful to students for taking stock at key points in their school career.

Results for New Brunswick (French)

Mathematics Content

There were significant differences at levels 1, 2, and 3 between the performance of New Brunswick French-language 13-year-old students and the Canadian average. For 16-year-old students, there were significant differences at levels 4 and 5.

In the 2001 assessment, fewer New Brunswick 13-year-old students who responded in French reached levels 1 and 3 than in 1997. Fewer 16-year-old students reached levels 1, 3, and 4 in 2001.

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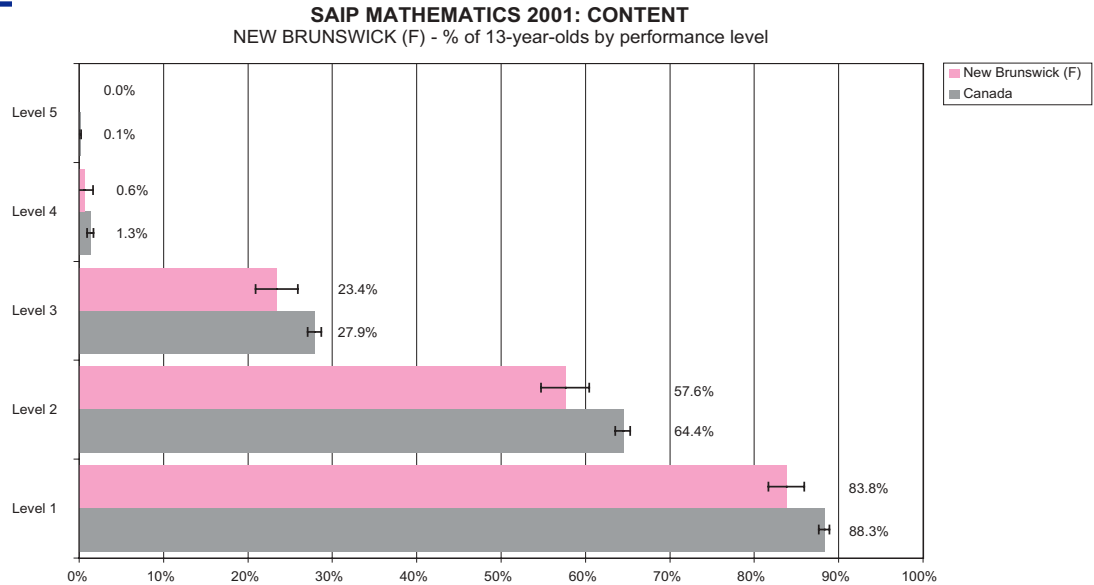
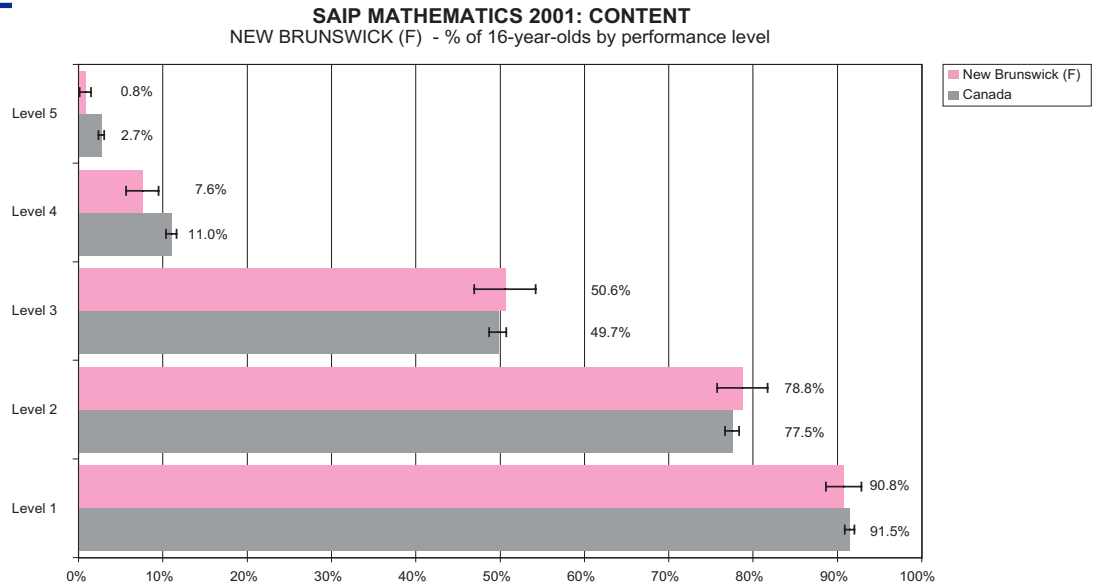


CHART NB(F)2



Problem Solving

New Brunswick students in both age groups who responded in French performed as well as or better than the Canadian average. For 16-year-old students, more achieved at level 3 than the Canadian average.

Since the 1997 assessment, the proportion of New Brunswick French-language 13-year-old students reaching levels 2 and 3 has increased. For 16-year-old students, the proportion has increased at levels 2, 3, and 4.

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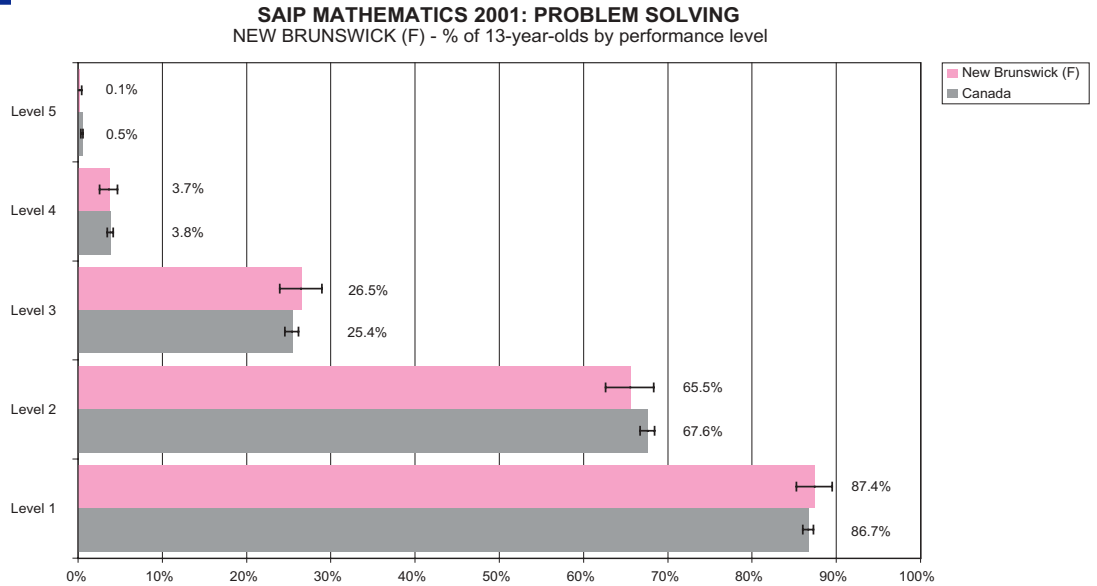
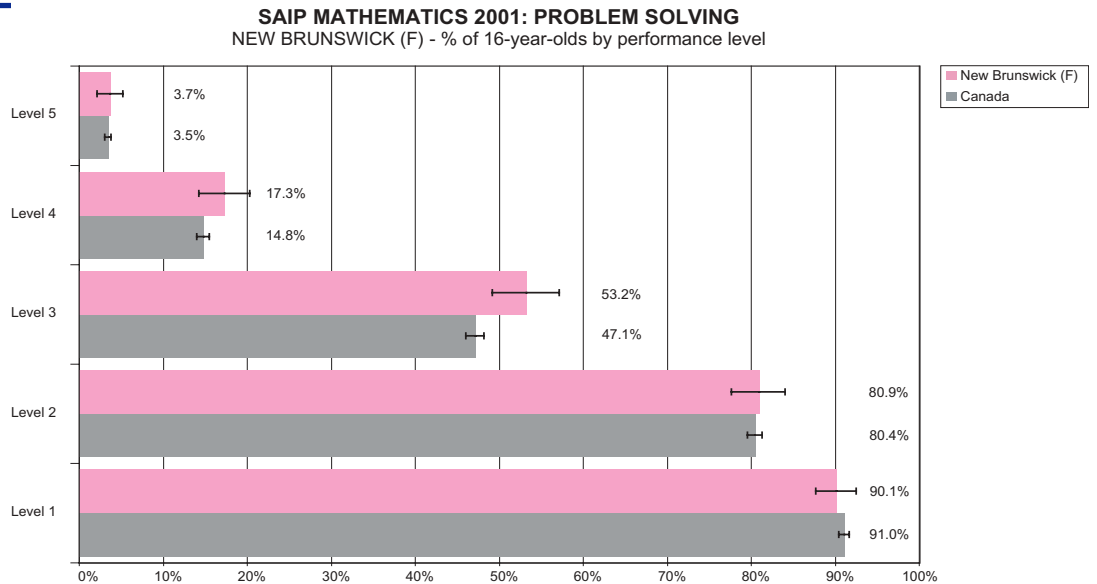


CHART NB(F)4



Context Statement

Social Context

Nova Scotia is a small province with a population of 942,700 and a higher rural population than the Canadian average. Population growth is currently below 1% annually. Immigration is low both in absolute numbers and compared to immigration in Canada as a whole. About 9% of the population speak both English and French, or French only. Among the total population, 2% is African Canadian, over 1.4% is Aboriginal, and over 1.5% consists of other visible minorities. Unemployment rates in Nova Scotia are typically above the Canadian average.

Organization of the School System

Nova Scotia's total school population is 155,873 from primary to grade 12. The province has a teaching force of 9,752. There are seven school boards. About 97.4% of the students are enrolled in anglophone school boards, and 2.6% of the students are enrolled in the Acadian school board. School enrolment is expected to decrease over the next few years.

Children who are 5 years old on or before October 1 of the current school year are admitted to elementary school. Students must attend school until they are 16 years old. For the most part, 13-year-old students are in grades 7 and 8, and 16-year-old students are in grades 10 and 11.

Mathematics Teaching

Nova Scotia has been working in collaboration with the other three provinces in Atlantic Canada in the development of an Atlantic Canada mathematics curriculum for kindergarten to grade 12. The philosophy and outcomes of this mathematics curriculum are stated in *Foundation for the Atlantic Canada Mathematics Curriculum* and are based on the National Council of Teachers of Mathematics (NCTM) standards described in *Curriculum and Evaluation Standards for School Mathematics* (1989) and *Principles and Standards for School Mathematics* (2000).

Nova Scotia firmly believes that a mathematical curriculum must be shaped by a vision that fosters the development of mathematically literate students who can extend and apply their learning and who are effective participants in an increasingly technological society.

The mathematically literate student will

- appreciate the utility and value of mathematics
- demonstrate mathematical power (i.e., display confidence and competence in his or her ability to do mathematics)
- be a mathematical problem solver
- communicate mathematically
- reason mathematically

Further, Nova Scotia believes that a mathematics curriculum should reflect the following realities about the nature of mathematics itself:

- Students must take an active role in their study of mathematics.
- Mathematics must be regularly connected to meaningful applications.
- Mathematics and mathematics instruction are greatly affected by changes in technology.

Mathematics Assessment

The Program of Learning Assessment for Nova Scotia (PLANS) includes mathematics assessments in elementary at grade 5 and junior high at grade 8, administered alternately from one year to the next. Currently, Nova Scotia Examinations (NSE) for anglophone students do not include grade 12 mathematics. Mathematics examinations will be administered following the completion of the implementation of the Atlantic Canada mathematics curriculum in senior high school.

Results for Nova Scotia (English)

Mathematics Content

There were significant differences between the performance of Nova Scotia 13-year-old and 16-year-old students who responded in English and the overall Canadian results at most levels. There were no significant differences for 13-year-old students at level 5 and for 16-year-old students at levels 1 and 2.

In the 2001 assessment, fewer Nova Scotia English-language students in both age groups reached levels 1 and 3, in mathematics content, than in the 1997 assessment.

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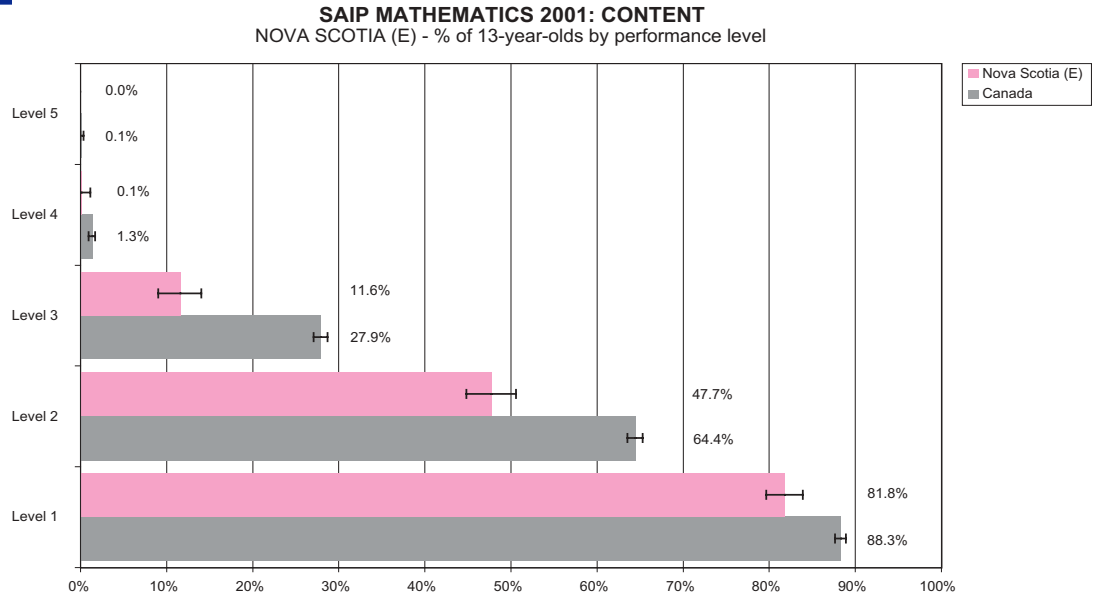
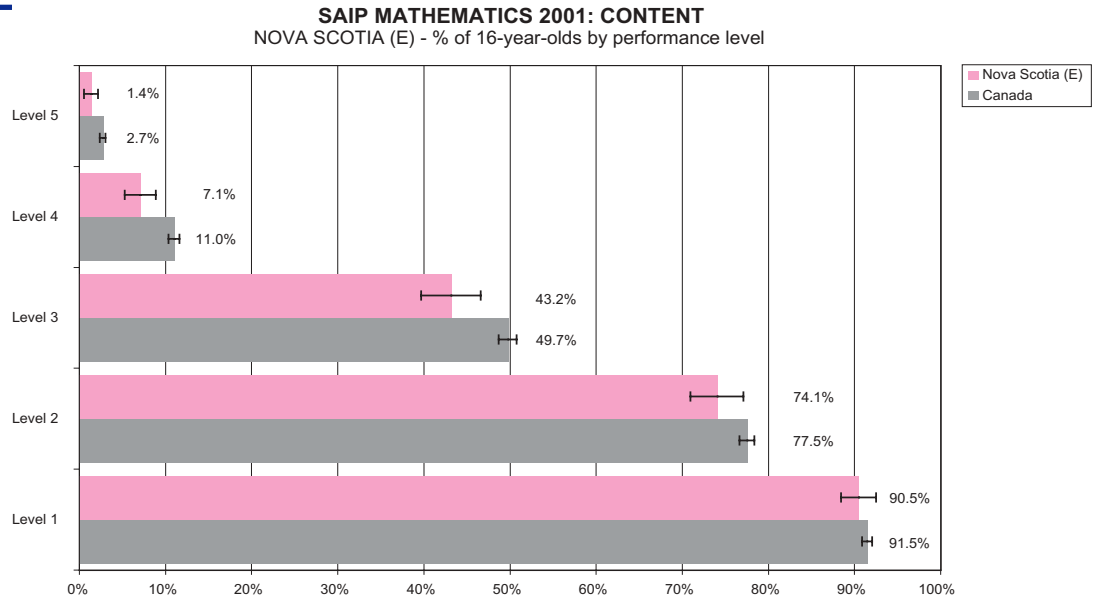


CHART NS(E)2



Problem Solving

There were significant differences between the performance of Nova Scotia 13-year-old students who responded in English and the overall Canadian results at levels 1, 2, 3, and 4. There were significant differences for 16-year-old students at levels 3 and 4.

In the 2001 assessment, more 16-year-old Nova Scotia English-language students reached level 5 in problem solving than in 1997. Otherwise there were no significant changes in performance in problem solving from 1997 to 2001.

CHART NS(E)3

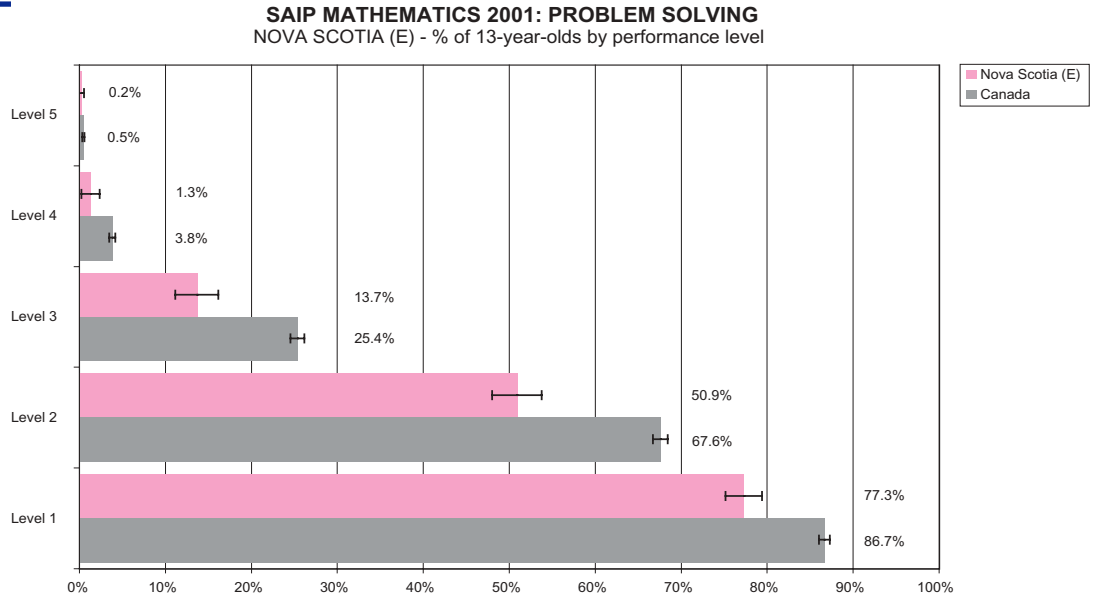
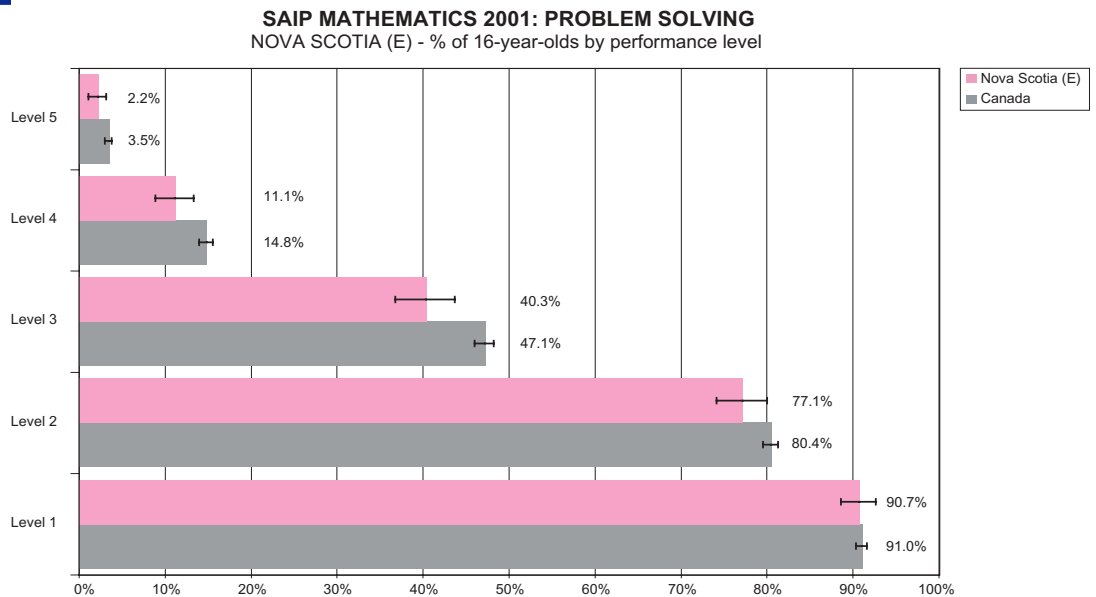


CHART NS(E)4



Context Statement

Social Context

Nova Scotia is a small province with a population of 942,700, and a higher rural population than the Canadian average. Population growth is currently below 1% annually. Immigration is low both in absolute numbers and compared to immigration in Canada as a whole. About 9% of the population speaks both English and French, or French only. Among the total population, 2% is African Canadian, over 1.4% is Aboriginal, and over 1.5% consists of other visible minorities. Unemployment rates in Nova Scotia are typically above the Canadian average.

Organization of the School System

Nova Scotia's total school population is 155,873 from primary to grade 12. The province has a teaching force of 9,752. There are seven school boards. About 97.4% of the students are enrolled in anglophone school boards, and 2.6% are enrolled in the Acadian school board (Conseil scolaire acadien provincial, CSAP). The CSAP is the only province-wide Acadian school board and includes 17 elected members. The board operates under a superintendent, who is responsible for the 18 schools. Acadian schools have been homogeneous since September 2001.

The program of studies for primary to grade 12 is developed under the direction of the Acadian and French-language Services Branch (AFLSB) at the Department of Education. The implementation of this outcome-based program is the responsibility of the CSAP.

Children who are 5 years old on or before October 1 of the current school year are admitted to elementary school. Students must attend school until they are 16 years old. For the most part, 13-year-old students are in grades 7 and 8, and 16-year-old students are in grades 10 and 11.

Mathematics Teaching

The French-language mathematics program is currently being implemented at the junior high level. A new senior high mathematics program is being developed and will be pilot-tested in Acadian schools in September 2002.

In Nova Scotia, the mathematics program is based on learning outcomes that have been developed jointly with the other Atlantic provinces and the Atlantic Provinces Education Foundation (APEF). The four areas of mathematics that form the organizational framework of the mathematics program from primary to grade 12 are numbers, patterns and relations, shape and space, and statistics and probability.

For each grade level, the program includes specific learning outcomes that integrate the knowledge, skills, and attitudes required to develop a mathematic and technology-based culture, with the following characteristics:

- communication
- problem solving
- relations
- reasoning
- mental arithmetic and estimation
- technology
- visualization

To help achieve the learning outcomes, the mathematics program promotes the learning of mathematics as an active process consisting of meaningful activities that reflect actual situations in the daily lives of students. Students are ultimately responsible for their own learning as they engage in a context of

collaboration and positive interaction. Teachers motivate their students to complete their tasks and provide a learning environment that fosters thoughtful analysis. Students

- believe in their own learning abilities
- understand that learning is relevant and important
- feel comfortable in the learning environment
- know that they are ultimately responsible for their own learning and attitudes
- use a wide variety of learning resources
- actively participate in their own evaluation, which is an integral part of the learning process

Mathematics Assessment

The Department of Education is currently developing assessments that will provide information on student achievement in relation to the learning outcomes in mathematics. The development of these assessments is the result of a collaborative effort between Department of Education staff and mathematics teachers.

Results for Nova Scotia (French)

Mathematics Content

There were significant differences between the performance of Nova Scotia 13-year-old students who responded in French and the overall Canadian results at levels 2 and 3. Nova Scotia French-language 16-year-old students performed as well as the Canadian average at all levels.

In the 2001 assessment, fewer Nova Scotia French-language students in both age groups reached levels 2, 3, and 4 in mathematics content than in 1997. Fewer 16-year-old students reached level 1 as well.

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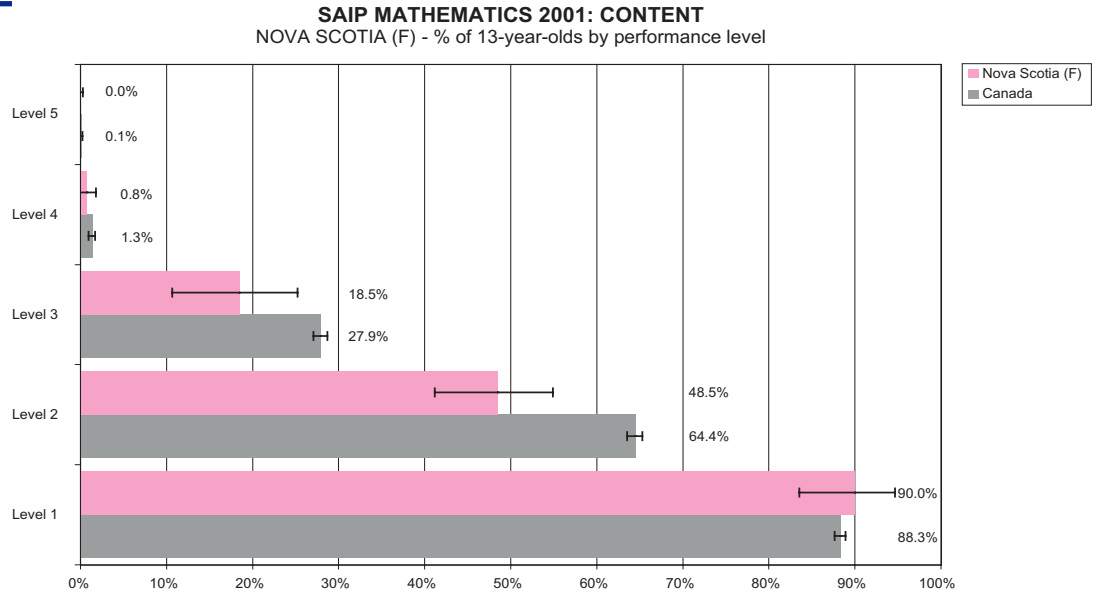
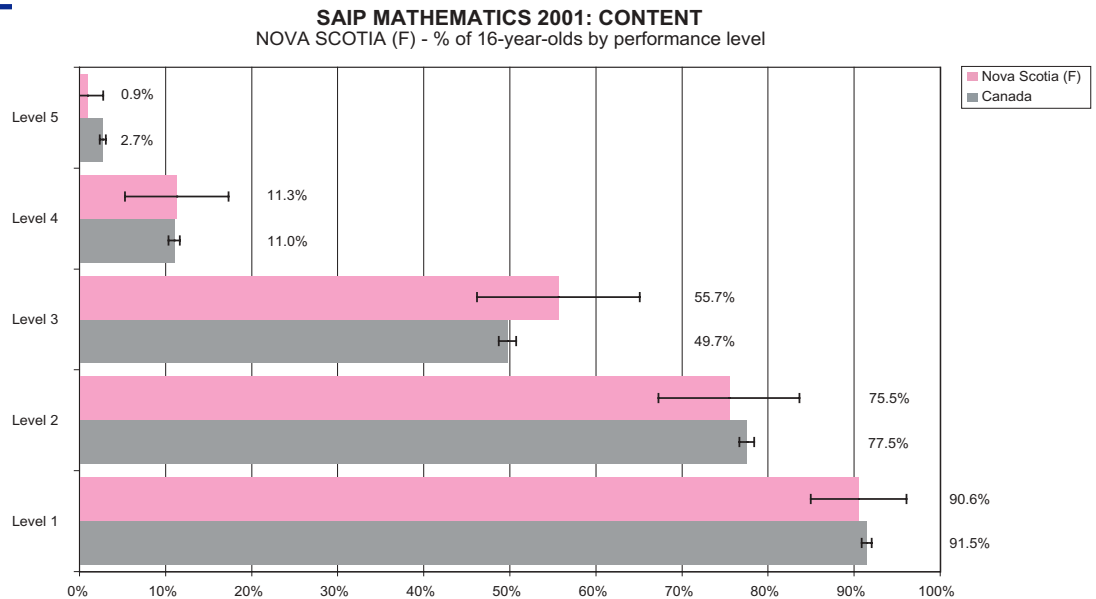


CHART NS(F)2



Problem Solving

There were significant differences between the performance of Nova Scotia 13-year-old French-language students at levels 3 and 5 and of 16-year-old students at levels 4 and 5 and the overall Canadian results. There were no significant differences at other levels for these students.

In the 2001 assessment, fewer 16-year-old Nova Scotia French-language students reached level 5 in problem solving. Otherwise, there were no significant changes in performance in problem solving between 1997 and 2001.

CHART NS(F)3

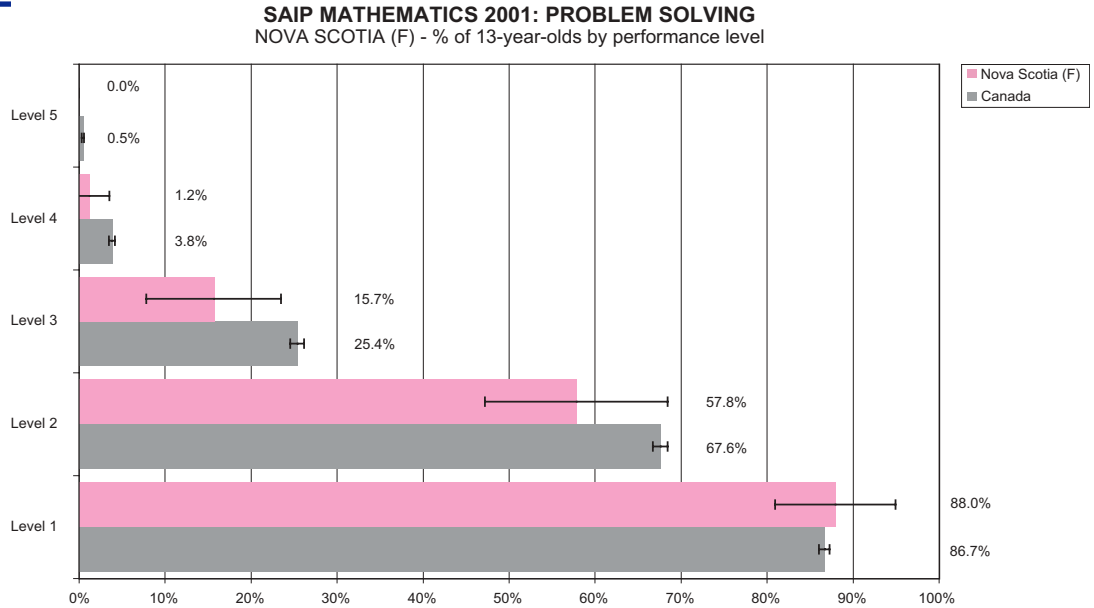
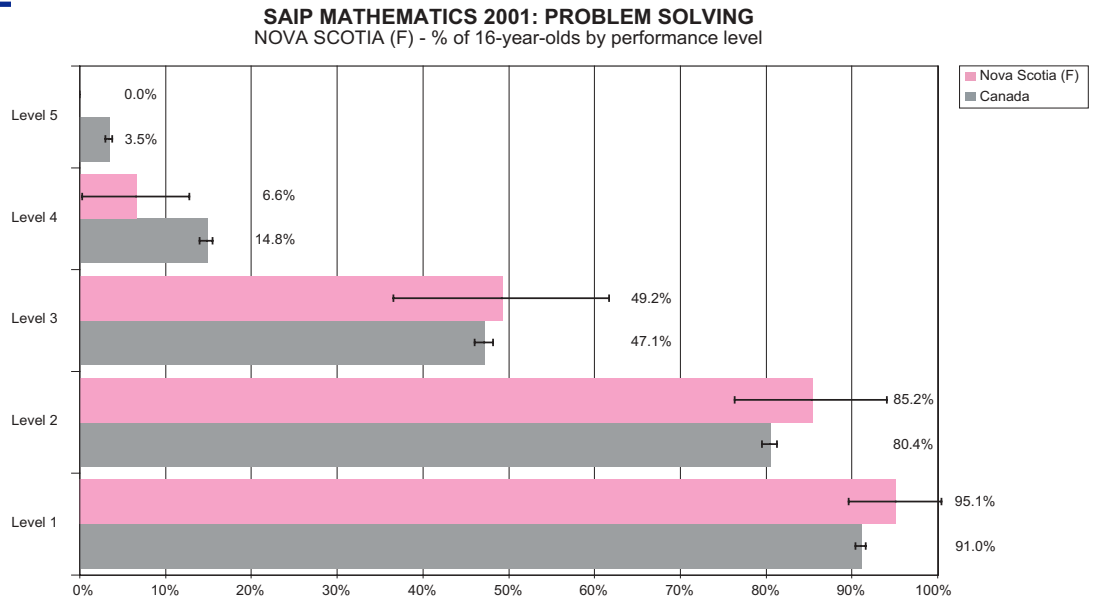


CHART NS(F)4



Context Statement

Social Context

Prince Edward Island is the smallest province in Canada, both in terms of land (5,600 square kilometres) and population, 139,100. Ninety-five per cent of the population speaks English. Sixty per cent of the population is rural and about 7 per cent live on farms. The setting is predominantly rural; agriculture, tourism, and fisheries are the major industries. The unemployment rate is above the Canadian average, and per capita income is below the Canadian average. The Confederation Bridge, the world's longest continuous multi-span bridge, opened in 1997 to connect this crescent-shaped island to the mainland.

Organization of the School System

At the time of the SAIP Mathematics III Assessment in 2001, Prince Edward Island's public school system had three school boards and 24,300 students enrolled in 69 public schools. The province has a teaching force of approximately 1,500 teachers employed by the school boards. Of the total student population, about 2.5% are enrolled in five French schools, and 15% are enrolled in French immersion courses. In addition, there were four private schools with 220 students and one school operated by First Nations.

The province expects school enrolment to decrease over the next few years.

In September 2000, Prince Edward Island introduced a province-wide publicly funded community-based kindergarten program, which attracted 97% of the province's eligible 5-year-olds.

The school system encompasses grades 1 to 12. Students entering grade 1 in September must be six years of age by the end of the following January.

Prince Edward Island's students are accommodated within facilities that contain a number of grade configurations; grades 1–3, 1–4, or 1–6; 4–6, 5–8, 1–8, 1–9; 7–9, 9–12, and 10–12. This diversity results from demands placed on the school by the local community, the school enrolment, and existing facilities.

In Prince Edward Island, the 13-year-old students who participated in the SAIP Mathematics III Assessment were for the most part in grades 7 and 8 where mathematics is taught as one of the subjects; the 16-year-old students were in programs at the grade 10 or 11 level, and are required to take at least two mathematics courses for high school graduation.

Mathematics Teaching

In Prince Edward Island, learning is highly valued, and equitable opportunities for lifelong learning are a priority.

The province has been working in collaboration with the Atlantic Provinces Education Foundation on the development of the Atlantic Canada mathematics curriculum for grades 1 to 12. The philosophy and outcomes of this mathematics curriculum are stated in the *Foundation for the Atlantic Canada Mathematics Curriculum*, which is based on the National Council of Teachers of Mathematics *Curriculum and Evaluation Standards for School Mathematics (1989)*.

Currently, the mathematics curriculum has been revised, and resources have been updated at most grade levels, with piloting and implementation occurring now at the higher grades.

Mathematics Assessment

Prince Edward Island does not undertake large-scale provincial assessment programs. Classroom teachers are responsible for assessment, evaluation, and promotion of their students from grade 1 through 12.

Prince Edward Island teachers are encouraged to use a variety of assessment strategies that are aligned with the learning outcomes and to integrate assessment with their instruction; they use this information to help them make decisions about their teaching practices and strategies and to inform students, parents, and other school personnel about student progress.

Results for Prince Edward Island

Mathematics Content

In general, there are significant differences between the achievement of Prince Edward Island students of both age groups and the Canadian average in mathematics content. Prince Edward Island 13-year-old students performed as well as Canada overall at level 5.

In the 2001 assessment, fewer 13-year-old students reached level 1; otherwise, there were no significant changes between 1997 and 2001.

CHART PEI1

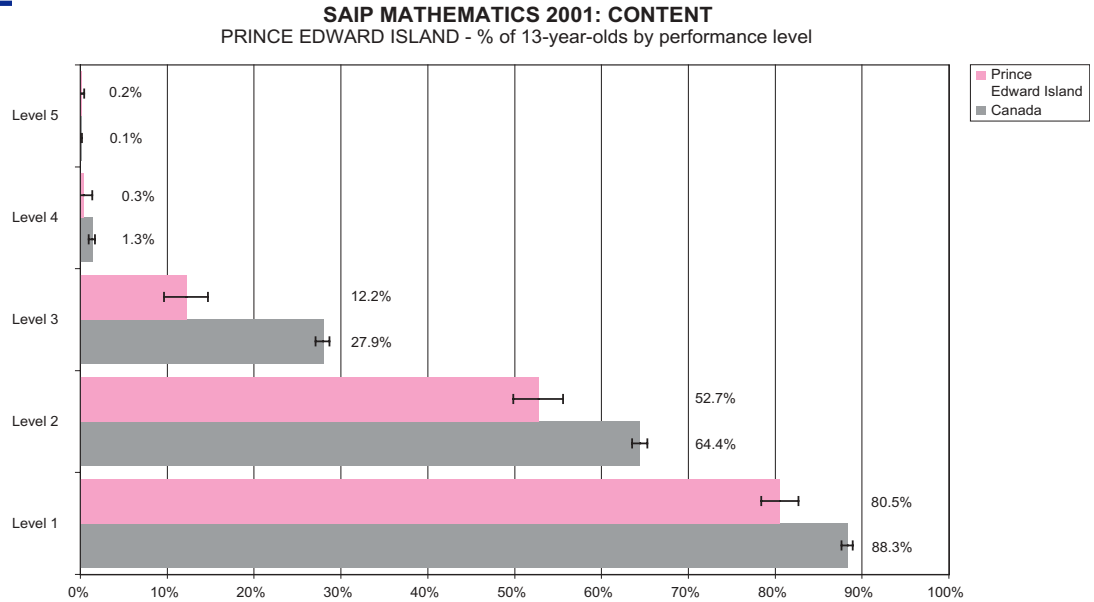
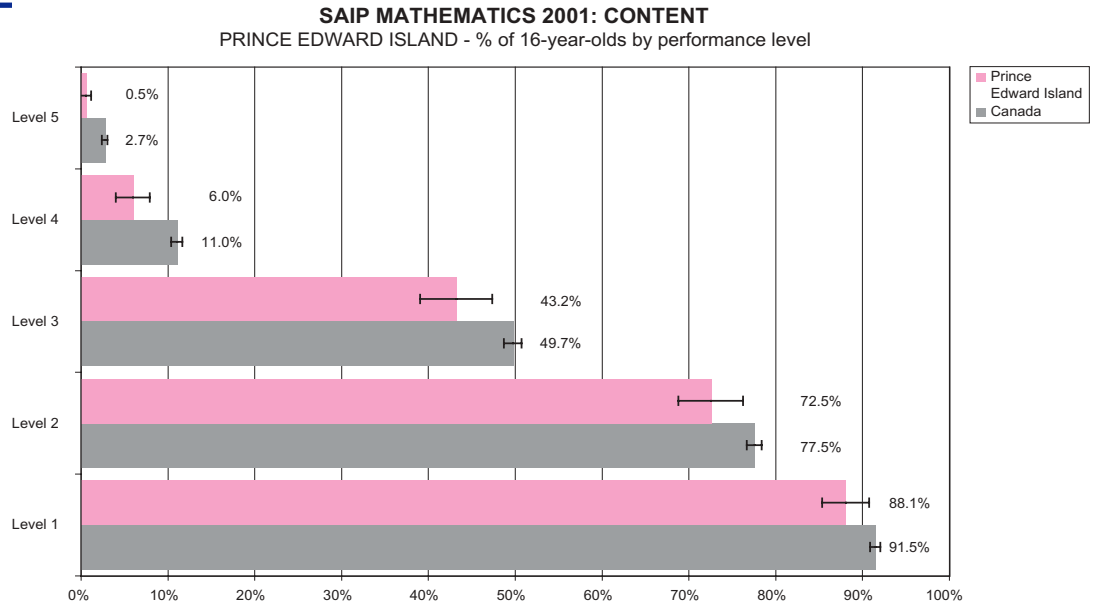


CHART PEI2



Problem Solving

In general, there are significant differences at levels 1, 2, and 3 between the achievement of 13-year-old Prince Edward Island students and the Canadian average in problem solving. Prince Edward Island 13-year-old students performed as well as Canada overall at levels 4 and 5. There are significant differences at levels 3, 4, and 5 between the achievement of 16-year-old Prince Edward Island students and the Canadian average. Prince Edward Island 16-year-old students performed as well as Canada overall at levels 1 and 2.

In the 2001 assessment, more 16-year-old students reached levels 2 and 3 than in 1997. There were no other significant changes in the results of the 2001 assessment.

CHART PEI3

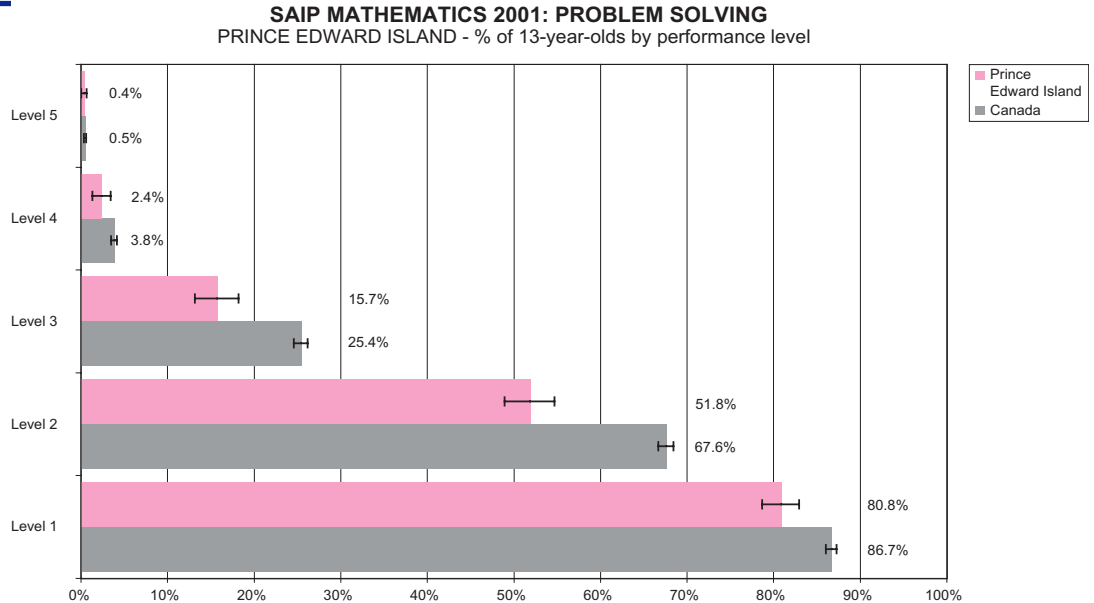
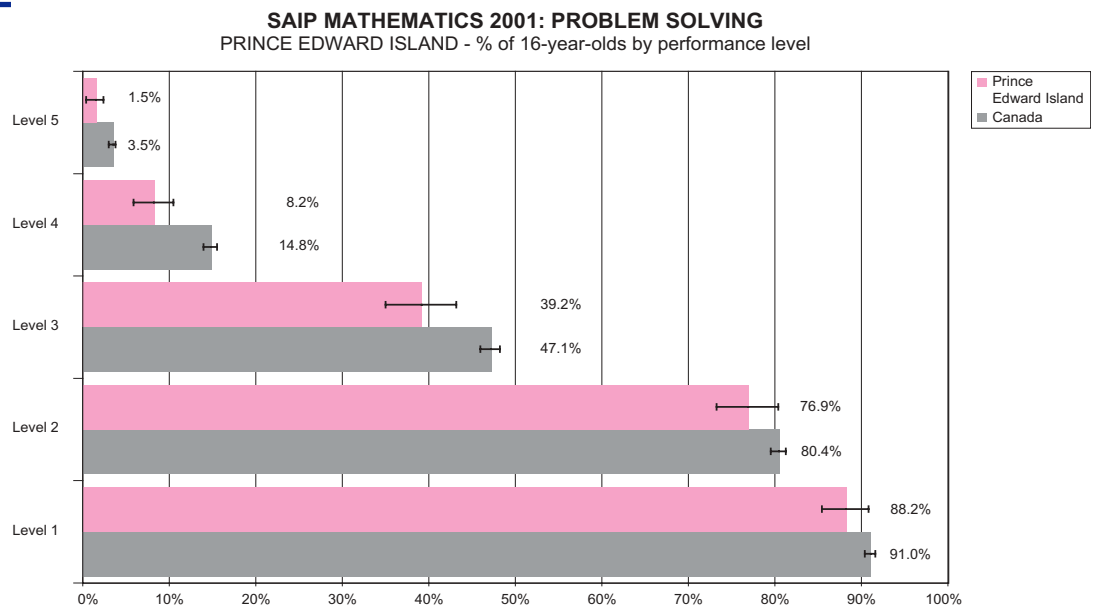


CHART PEI4



Context Statement

Social Context

In Newfoundland and Labrador, there are more than half a million people spread over an area of about 150,000 square kilometres. The small population and large size of the province make it difficult and expensive for the government to provide educational programs and services. This problem may be somewhat compounded by declining enrolments since 1972. The economy is expected to increase significantly with a predicted GDP growth of 5.4% by 2002. This is probably the result of activity in the mining sector, growth in tourism, and increased fisheries output. As well, employment is expected to increase by 1.9% over the next year within the province.

Organization of the School System

The province's education system has changed from a church-based system to a fully public one. This has resulted in the consolidation of school boards, a reduction in the amount of duplication in the system, and the closure of many schools. As of September 1998, there were 11 publicly elected school boards (including one francophone board), 337 schools with a total student enrolment of 90,167, and 6,283 school-based educators.

Even though school entry is compulsory for children of six years of age by December 31, most enter kindergarten if they are five by that date. Typically 13-year-olds are in grade 8, and 16-year-olds are in grade 11.

Mathematics Teaching

Over the past few years, major changes in the secondary mathematics curriculum have been driven by significant events at the provincial, national, and international levels. New directions in mathematics education have been put forward in such documents as *Curriculum and Evaluation Standards for School Mathematics* (National Council of Teachers of Mathematics, 1989) and *Professional Standards for Teaching Mathematics* (NCTM, 1991). These publications and more recent ones such as the *Principles and Standards for School Mathematics* (NCTM, 2000) have had a significant impact on the nature of changes to the mathematics curriculum and instruction, including the implementation of new curriculum in 2001.

Currently, all students from kindergarten to grade 9 are required to take mathematics as part of their education program. The mathematics curriculum for these grades is a common curriculum. All students do the same program at a particular grade level, unless they are identified as having special needs. To graduate, high school students must complete two 2-credit courses as part of their required program. Each of these courses represents a minimum of 110 instructional hours. Programming in mathematics at the high school level provides three possible pathways for students: practical, academic, and advanced. Approximately one-quarter of the students take the practical program, one-half the academic, and one-quarter the advanced program. Some students also take such optional courses as statistics, calculus readiness, and advanced placement calculus. The vast majority of students study mathematics in all years of their high school program.

The mathematics curriculum is in the process of revision from kindergarten to grade 12. This new curriculum is based on a framework described in the *Foundation for the Atlantic Canada Mathematics Curriculum*, as part of an Atlantic Canada Common Core Curriculum Initiative. In this province, implementation of this new curriculum has occurred in kindergarten and in grades 1 and 10, with implementation in grades 2, 7, and 11 and partial implementation in grade 12 occurring as of September 2001. Piloting is ongoing at grades 3, 4, and 5, with some piloting occurring in grade 12.

Mathematics Assessment

In recent years, there has been an increased emphasis on criterion-referenced testing. Criterion-referenced tests in mathematics were administered to grade 3 students in 1993, 1996, and 2001; to grade 6 students in 1994 and 1995; and to grade 9 students in 1997 and 1999. Until 1996, examinations were written in all exit-level mathematics courses. As of June 2001, these exams were reinstated and administered in academic mathematics and advanced mathematics.

Results for Newfoundland and Labrador

Mathematics Content

Newfoundland and Labrador 13-year-old students performed as well as Canada overall at levels 4 and 5. There were significant differences at other levels for 13-year-old students, and at all levels for 16-year-old students.

In the 2001 assessment, fewer students reached level 1 in both age groups in mathematics content than in 1997.

CHART NF1

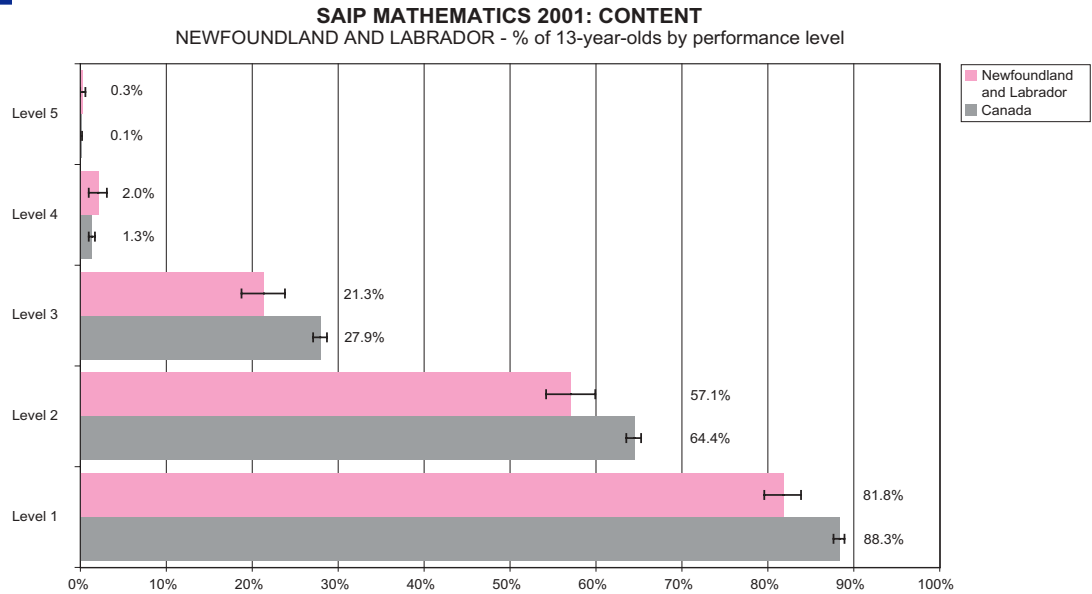
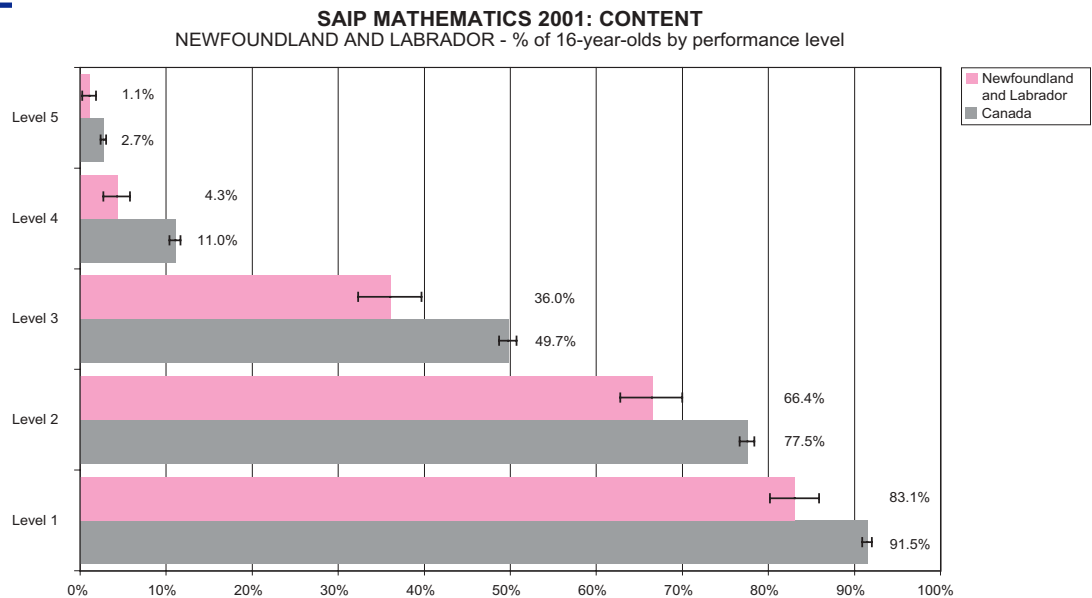


CHART NF2



Problem Solving

Newfoundland and Labrador 13-year-old students performed as well as Canada overall at levels 3, 4, and 5. There were significant differences at other levels for 13-year-old students, and at all levels for 16-year-old students.

In the 2001 assessment, more 13-year-old students reached levels 2, 3, and 4 than in 1997 in problem solving.

CHART NF3

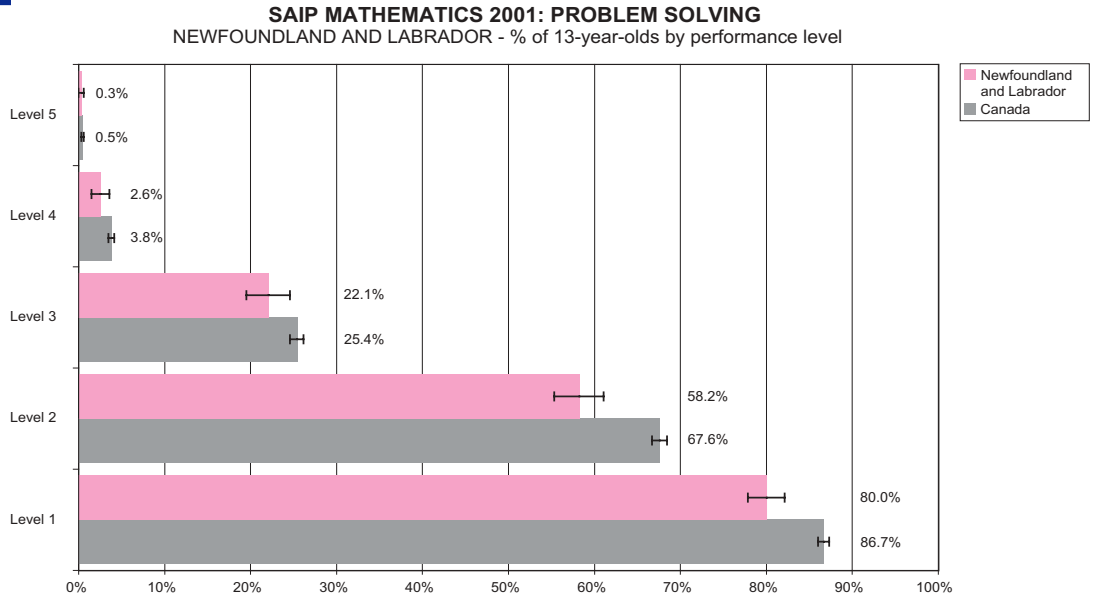


CHART NF4

