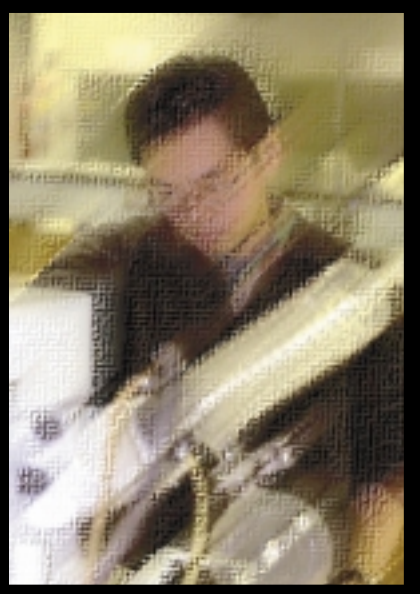

School Achievement Indicators Program

SAIP

Mathematics III 2001

Mathematics Learning: The Canadian Context

Council of Ministers of Education, Canada
Conseil des ministres de l'Éducation (Canada)

Mathematics Learning: The Canadian Context

SAIP

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Mathematics III

2001

Council of Ministers of Education, Canada

The Council of Ministers of Education, Canada (CMEC), created in 1967, provides the ministers responsible for education in the provinces and territories with a mechanism for consultation on educational matters of mutual interest and concern, facilitates cooperation among the provinces and territories on a broad range of activities at the elementary, secondary, and postsecondary levels. CMEC Secretariat offices are located in Toronto.

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INTRODUCTION

The School Achievement Indicators Program (SAIP)

Canadians, like citizens of many other countries, want their children to have the best educational preparation possible. Consequently, they ask how well our educational systems prepare students for lifelong learning and for participation in the global economy.

To help answer this question, ministries[1] of education have participated in a variety of studies since the mid-1980s. Most recently, at the international level, Canadian provinces took part in the Programme for International Student Assessment (PISA) prepared through the Organisation for Economic Co-operation and Development (OECD). During the past decade, individual jurisdictions have also participated in achievement studies such as the International Adult Literacy Study (IALS) and the Third International Mathematics and Science Study (TIMSS). In addition, most ministries enhanced their procedures for assessing student achievement at different stages of schooling within their own jurisdictions.

Since all ministers of education wish to bring the highest degree of effectiveness and quality to their systems, they have long recognized a need for collective action to assess these systems. They acknowledge that achievement in school subjects is generally considered to be one worthwhile indicator of the performance of an education system. In particular, the ministers wanted to answer as clearly as possible the question: "How well are our students doing in mathematics, language, and science?"

In that context, the Council of Ministers of Education, Canada (CMEC) initiated in 1989 the School Achievement Indicators Program (SAIP). It was a first-ever attempt by the ministers of education of all provinces and territories to arrive at a consensus on the elements of a pan-Canadian assessment. In a memorandum of understanding signed in December 1991, the ministers agreed to assess the achievement of 13-year-old and 16-year-old students in reading, writing, and mathematics. In September 1993, the ministers further agreed to include the assessment of science. They decided to administer the same assessment instruments to the two age groups to study the change in student knowledge and skills due to the additional years of instruction. The information collected through the SAIP assessments could be used by each jurisdiction to set educational priorities and plan program improvements.

[1] In this report, "ministry" means "department" as well, and "jurisdiction" means both "province" and "territory."

The first two cycles of assessments took place between 1993 and 1999. The mathematics assessment of the third cycle was administered in April 2001, and the public report was released in March 2002. This report is a companion to the 2002 mathematics public report and presents the results from the student, teacher, and school questionnaires that were designed to enhance the achievement results by providing much more comprehensive information on the context of mathematics learning than was available in earlier assessments.

The SAIP Enhancement

Learning is a complex process, affected by many factors within student background and experience, school and classroom conditions, resources, motivation, quality of schooling and teaching, attitudes and expectations. SAIP had originally been thought of as a comprehensive indicators program, through which data would be gathered on many of the factors that might influence learning. Earlier SAIP assessments had included brief student questionnaires that gathered some data on student backgrounds and activities. However, little use was made of this information other than the inclusion of brief summaries as supplements to the main achievement reports.

In September 1998, CMEC approved a proposal to enhance SAIP through the administration of comprehensive school, teacher, and student questionnaires. For the 1999 Science and now the 2001 Mathematics assessments, all students completing the achievement assessments were asked to complete a questionnaire. Additionally, teachers identified as teaching mathematics to the sampled students, along with the principals of all sampled schools, were also asked to complete questionnaires. The questionnaires included items on student backgrounds and activities, school characteristics, decision making, resources, classroom practices, opportunity to learn, attitudes toward school and mathematics, and teacher backgrounds and specialization.

Questionnaire Framework

The structure of the questionnaires was based on a conceptual framework developed from an initial Input→Process→Outcome model of learning. This model was elaborated on the basis of a comprehensive synthesis of research conducted by Wang, Haertel and Walberg (1993). Specifically, items were included under seven major categories:

1. the provincial/district context (e.g., size, autonomy, resource allocation)

2. the out-of-school context (e.g., community size and type, home environment, home language)
3. the school context (e.g., structure and size, leadership style, policies, programs)
4. student characteristics (e.g., aspirations, attributions of success/failure, importance of school and mathematics)
5. program design (e.g., implemented curriculum, lesson planning, materials use)
6. teacher characteristics (e.g., qualifications, experience, views on mathematics and mathematics teaching)
7. classroom instruction and climate (e.g., classroom routines, use of time, classroom climate, homework)

A more detailed description of the questionnaire framework and development procedures is given in Appendix A.

Populations, Samples, and Sampling Error

In April and May 2001, the third mathematics assessment — both assessments and questionnaires — was administered to random samples of students drawn from a total of 18 different populations, representing all of the provinces and territories, along with separate language groups within the provinces of Manitoba, Ontario, Quebec, New Brunswick, and Nova Scotia. The sampling scheme was designed to yield representative student samples of sufficient size to permit separate reporting for each population. Approximately 41,000 students made up the total sample, 24,000 13-year-olds and 17,000 16-year-olds (16-year-olds in Quebec did not participate). About 33,000 students completed the assessment in English and 8,000 in French. About half the students wrote a content version and half a problem-solving version of the assessment.

The sampling procedure was designed to yield a representative sample of students in each of the 18 population groups identified. For large populations, an initial representative sample of schools was selected, and for smaller populations all schools having students in the relevant age groups were selected. The school questionnaires were completed by the principals of all schools taking part in the assessment, a total of just over 2,000 schools. For some provinces and territories, where the total number of students was small, all students in the two relevant age groups were selected.

The teacher questionnaire sample was derived from the student sampling scheme. The teacher sample was defined as all teachers who taught mathematics in the 2000–2001 school year to any of the students completing the assessment. This means that more than one teacher in a school may have completed the questionnaire. However, it was not possible to determine if all possible teachers had been identified or if teachers in particular types of schools were over- or under-represented in the sample.

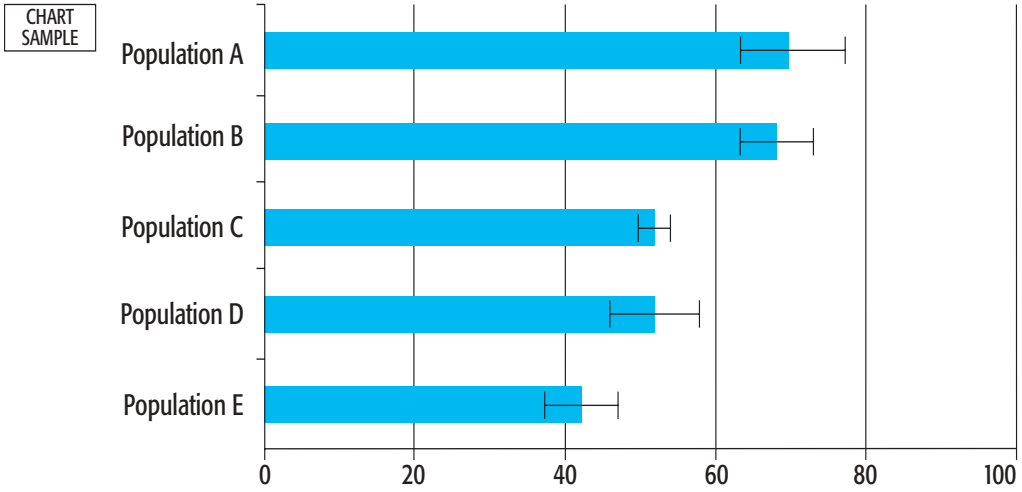
Most of the results presented here are in the form of percentages responding to a particular category or combination of categories. Because the responses are based on samples, they are only estimates of the responses that would have been received had all members of the relevant populations been surveyed. It is common practice in survey research to give a range, known as a confidence interval, within which the actual population value is expected to fall, with a known degree of confidence (usually 95%). The width of the confidence interval is typically related to the sample size and whether the response is near the middle or at the extreme of the scale (e.g., responses near 10% or 90% have smaller errors than those near 50%). The confidence interval is related to population size, only if the population is relatively small. The confidence interval is zero if the sample consists of a census (that is, all members of the population are surveyed). Since the samples for some of the smaller populations (such as those in the territories and some francophone populations) were close to a census, the confidence intervals are narrower for those populations than would be the case for the same size samples drawn from larger populations.

Comparisons between populations are made with reference to the confidence intervals. Differences are said to be statistically significant if the confidence intervals do not overlap. Confidence intervals are given in this report for the school and student results, in the form of "error bars" on the charts. In comparing two provinces, for example, the difference should be considered significant only if the two error bars do not overlap. Confidence intervals could not be computed accurately for the teacher results because the teacher sample could not be considered as a probability sample. Comparisons across jurisdictions for the teacher questionnaire are therefore made cautiously.

In practice, with large samples, the difference required for policy or practical importance is in most cases much larger than the width of the typical confidence interval. For example, confidence intervals for student responses are typically ±5% or less. However, readers are cautioned not to attach much practical significance to observed differences less than ±10%. In almost all cases, the differences highlighted in this report are much larger than the width of the confidence intervals.

It is important to note that the Canadian composite results (labelled "CAN" in the charts) given for the school and student questionnaires are "weighted" to account for differences in sizes of the different populations. Large populations, particularly Ontario English and Quebec French, contribute more to the Canadian composite than smaller populations. The Canadian composite could not be computed for the teacher questionnaire because the size of the teacher population was not known.

MEAN PERCENTAGE RESPONSE OF POPULATIONS WITH ERROR BARS REPRESENTING CONFIDENCE INTERVALS



Sample Chart

The chart above is provided to illustrate error bars and to help readers interpret the confidence intervals given in this report. In this chart, Populations A and B are not significantly different from each other but are significantly different from the other three populations. Population C is significantly different from population E but not from population D. Populations D and E are not significantly different from each other.

Note: When the assessment elicited no significant information for a population, the bar beside the symbol for that population group is blank or shaded, or the box contains a "-" or "0".

Purpose and Structure of This Report

The ultimate goal for questionnaire analysis is to link the responses on the three questionnaires with the achievement levels of students, in order to examine in detail how contextual factors are related to achievement. In this report, the results are first presented descriptively for each population, with a view to giving a snapshot of students, teachers, and schools in Canada and in the separate populations used by SAIP. This is followed by an analysis of correlations between questionnaire responses and achievement for students and schools. Correlations could not be computed for teachers because of difficulties in matching teachers with individual students. The emphasis in the correlational analysis is on patterns of correlation that are consistent across jurisdictions. These results are generally not useful for comparing jurisdictions. Instead they are examined for consistent patterns that show relationships that may be important for policy, practice, or further research.

SCHOOL CONTEXT

The school questionnaire was completed by the principal. The questionnaire contained 31 items covering school demographics, student characteristics, policies on matters such as school improvement, collaboration, student evaluation, homework, absenteeism, locus of decision making, sources of influence on the school, factors limiting the school's capacity to provide instruction, computers and their use, course organization, streaming, remediation, and enrichment. The questionnaire also asked principals for their opinions on a range of issues related to factors affecting student learning, school spirit and morale, and support for the school.

School Demographics

Principals were asked to describe the type of community in which their school was located by selecting from one of six categories. **Chart 1**[2] shows the results for the two smallest types (rural, small town) and the two largest types (medium or large city). As expected, a general East-Central-West division is apparent here, with many more schools in the East (and North) located in rural or small town areas than in Central or Western provinces, while in Ontario and Quebec there are fewer rural/small town schools than in other provinces in either the East or the West.

Chart 2 shows the percentage of schools with fewer than 100 or more than 500 students. Generally speaking, school size tends to follow population size and the urban/rural distribution. However, Nova Scotia and New Brunswick do have a relatively larger proportion of 500+ schools than their overall population would indicate. This no doubt reflects the relatively small geographical size of these provinces, which facilitates school consolidation.

An indication of the prevalence of community-based rather than consolidated schools is given by the percentage of students who live within walking distance of their school, as shown in **Chart 3**. A unique pattern occurs here for the territories, where, despite (or perhaps because of) their large geographical areas, they manage to preserve mainly community schools. Beyond this, an East-West division is again apparent, with Western provinces having more students within walking distance of their school than Central or Eastern provinces. This is likely linked in a complex way to school size, to the proportion of rural and urban schools in a province, and to policies on transportation distances.

The underlying issue in whether students can walk to school or whether they have to be transported is the impact on the school schedule of travel requirements. **Chart 4** shows the percentage of schools for which principals reported their schedules being substantially or severely restricted by student travel. The greatest proportions are found in the Ontario, Quebec, and Nova Scotia francophone populations. This problem is less prevalent in the territories, Saskatchewan, and Manitoba English than in other jurisdictions.

Student Characteristics

Chart 5 shows the percentage of schools with 10% or more of their students having a first language other than the language of the school. Aside from the territories, where Aboriginal languages are prevalent, the most interesting feature here is the relatively high proportions in most of the francophone populations (with the exception of New Brunswick) outside Quebec and in the Quebec anglophone population. This suggests that a difference between school and home language may be more prevalent among minority official language groups than among immigrant populations. One possibility is that minority official language schools may be attracting students from the majority-language group. There are also indications that some French Immersion students were counted as part of the francophone population. Finally, it is possible that many students with official minority-language status may actually speak the majority language at home.

The percentage of schools with more than 10% of their students reported as having learning problems requiring special attention is given in **Chart 6**. Here the three territories are distinguished by having much higher proportions of such schools than others.

Studies have shown that children from single-parent families tend to have greater learning problems than others (although it is debatable whether family status or poverty is the underlying problem). **Chart 7** shows the percentage of schools with more than 25% of their students from single-parent families. The highest proportions are found in British Columbia, Quebec, the Northwest Territories, and the Yukon, and the lowest in Saskatchewan and Newfoundland and Labrador.

[2] The confidence intervals given in these charts are based on a "finite population adjustment" used when the samples are selected from relatively small populations. This results in narrower confidence intervals than would be found for the same sample sizes selected from large populations. The width of the confidence interval thus reflects both sample and population size. The confidence interval is zero for Nova Scotia French because all schools in this population were sampled.

Class Size and Arrangements for Teaching Mathematics

Principals were asked to estimate average class sizes in their school as a whole and in mathematics classes at the two SAIP age levels. This allows us to examine the question of whether mathematics classes are comparable in size to other classes in the school. **Chart 8** gives the percentage of classes with 25 or more students for both age groups. The between-jurisdiction differences are substantial. The Quebec francophone population stands out as having the most schools reporting classes over 25 in both categories. The pattern for mathematics classes tends to follow that for schools as a whole, with no particular tendency toward either larger or smaller mathematics classes. The notable exception is Prince Edward Island, where mathematics classes for 16-year-olds are significantly larger than overall class size.

More generally, minority-language schools tend to have smaller classes than those of the majority-language group. It is likely that this is related to other factors such as school size and multi-grading or multi-course teaching in the same classroom. Further breakdowns are needed before a complete picture of class sizes can be presented.

Chart 9 shows that most courses for 16-year-olds are semestered, while semester courses are much less prevalent for 13-year-olds. The proportion of schools using semester courses varies substantially by jurisdiction. Quebec and Newfoundland and Labrador stand out as making little use of semester courses at either level.

In almost all schools in all populations, 13-year-old students follow the same course of study in mathematics. The same is not true for 16-year-olds, however, as shown in **Chart 10.** At that level, relatively few schools have only a single stream in mathematics. The most prevalent pattern is two streams. However, three or more streams are common in about half the jurisdictions.

Chart 11 indicates that mathematics classes for 16-year-olds are taught primarily by teachers specialized in mathematics in almost all jurisdictions. However, the pattern is much more variable for 13-year-olds, where there tends to be less specialization in smaller than in larger jurisdictions (with the exception of Ontario), and in minority-language groups relative to majority-language groups within jurisdictions.

These patterns no doubt reflect broader differences in the organization of schools in different jurisdictions and the structure of senior high school grades, where 16-year-olds are found, compared to middle or intermediate grades, which include most 13-year-olds. Course credit systems along with program differentiation and choice are more characteristic of later than of earlier school years.

School Policies and Decision Making

The school questionnaire contained a large number of items on sources of influence and control of school policies and decision making. The most direct point of interest here was the degree of internal versus external control of school affairs and the existence of policies in areas such as discipline, homework, and school improvement.

Principals were asked to indicate whether or not their schools have active school improvement teams and plans, policies to recognize teacher excellence, regular staff meetings, written policies on evaluation, discipline, absenteeism, and homework. Almost all schools reported having goals and plans for improvement and having regular staff meetings. Most also reported having written policies on discipline and absenteeism. The latter showed jurisdictional differences, with Quebec francophone schools more often and schools in the Northwest Territories and Nunavut less often having such policies. In general, fewer schools in Quebec than in other jurisdictions tended to have policies promoting collaboration and improvement. Relatively few schools in any jurisdiction reported having a policy to recognize teacher excellence. Policies on homework showed the greatest jurisdictional differences, as indicated in **Chart 12**. However, there appears to be no distinct geographical or language pattern here such as is found in many other areas.

The locus of decision making was the subject of a series of questions in which principals were asked to identify the level at which decisions are made or the level at which influence is exerted on these decisions. Here, the most interesting point of contrast is between within-school and external decision making, as this is a measure of school autonomy. Wide differences between jurisdictions were identified for a number of important areas of decision making. Because of the complexity of the data, only a selection of results is presented here.

Chart 13 shows the relative and cumulative influence of the school district and the principal on teacher hiring decisions. It is clear that in most jurisdictions, these two sources account for most of the decisions about hiring. Keeping in mind that these are the perceptions of principals, the obvious point of contrast between jurisdictions is on the internal-external dimension where, in some cases, most of the decision making is at the district level, while in others it is at the principal level.

A second important area of decision making lies in the choice of textbooks. **Chart 14** shows the influence of jurisdictional decisions. Remaining sources of influence, up to the 100% total, may be taken at the school level. Here again, the obvious contrast is

between within-school and external decision making, with widely different total external influence being found across jurisdictions. In particular, there is a general East-West division here, with jurisdictional influence being much more prevalent in the Atlantic provinces (and in the Yukon) than elsewhere. Clearly the Atlantic provinces and the Yukon have much more centralized textbook decision making than other jurisdictions. At the opposite extreme is Quebec French, where very few principals reported textbook decisions being made outside the school.

For most other areas, such as discipline, absenteeism, community relationships, contact with parents, and courses offered, decision making was reported as being done primarily within the school. It is notable, however, that francophone schools more often than others reported that the school (principal and teachers collectively) rather than the principal alone was responsible for assigning teachers to classes. The opposite was true for assigning students to classes or courses, where francophone schools more often than others reported the principal as mainly responsible. Determining course content was generally reported as a provincial responsibility. The exceptions were Quebec francophone and Nunavut schools, where the school was reported as more often responsible than the province.

Much can be learned about decision making by examining who controls various components of the school budget. Again, because of the large number of separate items, only a general summary will be presented. In general, there are sharp contrasts in locus of control between jurisdictions and between specific budget items.

1. Teacher salaries are almost universally controlled outside the school. Responses indicated either overwhelming provincial/territorial control or equally overwhelming district control. Specifically, this was identified as a district responsibility in Ontario, Manitoba, Alberta, and British Columbia. Presumably, this does not vary from school to school within a province, and is dependent on whether collective bargaining is conducted at a provincial or district level.
2. In most cases, capital expenditures were reported as being controlled by the district, as was the case for maintenance expenditures. Again, Quebec francophone schools were exceptional in reporting greater responsibility on the part of the principal in both of these areas. Newfoundland and Labrador and the Yukon were more likely to report capital expenditures as a provincial/territorial responsibility.
3. Salaries of non-teaching staff were generally reported as being a district responsibility. The exceptions here were Prince Edward Island and the Yukon, where this was seen by most as a provincial/territorial responsibility.
4. Responsibility for materials and supplies, including instructional materials and new technologies, varied among jurisdictions between districts and principals. The latter item was seen more often as a provincial/territorial responsibility in Prince Edward Island and the Yukon and more often as a principal responsibility in Quebec.

Locus of influence was also examined in a series of questions about how much influence various organizations, groups, and individuals have on the school's overall program and activities. Generally speaking, the provincial or territorial ministry, the school board, the principal, and teachers, both collectively and individually, were all almost universally perceived as having some or a lot of influence. Beyond this, a more mixed picture emerged. For example, while principals in most jurisdictions widely reported that parent advisory committees or school councils have some influence, these bodies were much more rarely seen as having "a lot of" influence compared to the previous groups. Similarly, students were not often seen as having a lot of influence, nor were textbook publishers, external committees, or professional associations, the business community, or the church or religious groups.

Because of the emphasis in recent years on accountability and the implementation of public examinations and other forms of provincial testing, along with SAIP and various international testing programs, it is worth looking in more detail at the influence of external examinations, tests, or standards on school programs. The percentage of principals reporting "some" or "a lot of" influence from this source is given in **Chart 15**. This chart shows considerable variation across jurisdictions, with relatively little influence being shown in Saskatchewan, Prince Edward Island, and the Yukon, and strong influence in Alberta, Ontario, Quebec, and New Brunswick francophone. Within provinces, francophone schools tended to report greater influence than anglophone schools.

A number of specific questions were asked about the level of parental involvement in various aspects of the life of the school. Relatively low levels of involvement, with substantial variation across jurisdictions, were found on such matters as volunteering in classrooms, monitoring student behaviour, and serving on committees. Somewhat higher, but also quite variable, levels of involvement were found for decisions on selection of the principal and teachers, despite other information suggesting that parents are not the primary sources of influence in these decisions.

Fairly high levels of parent involvement were found in the areas of fundraising and of interaction with staff on matters affecting their own children. The patterns in these areas are reported in **Charts 16** and **17**. Interactions with staff were relatively higher in Alberta, Manitoba English, Ontario English, and Prince Edward Island. In Quebec and Ontario, francophone parents were reported as having less interaction than anglophone parents. In the area of fundraising, involvement was relatively lower in the Yukon, Northwest Territories, Prince Edward Island, and New Brunswick English

than in other jurisdictions. In Quebec and New Brunswick, fundraising was more prevalent in the francophone than in the anglophone populations.

Factors Limiting Ability to Provide Instruction

Two sets of questions were asked on this issue. The first was concerned with external factors such as parental support, student background, and community conditions; the second with school resources and facilities.

Chart 18 shows the percentage of principals reporting that community conditions and lack of parental support are limiting factors. An obvious pattern of greater concern with these two factors is evident in territorial schools. Francophone schools in Ontario and Nova Scotia also show relatively high levels of concern in these areas. A similar pattern for territorial schools is found for student ability and home background, as shown in **Chart 19.** In this case, however, all jurisdictions appear to see student factors as more limiting than parent and community factors.

Chart 20 shows the percentage of principals indicating that instruction in their schools is limited by a shortage of teachers specialized in mathematics and other specialists such as guidance counsellors. The pattern here is that more schools in Eastern jurisdictions and in the territories report a shortage of specialists.

Finally, **Chart 21** shows responses to a question on whether instruction in mathematics is limited by a lack of manipulative materials. While the percentage of schools reporting this to be a problem is generally lower than for other problem areas, there is a clear pattern of francophone schools, except those in Quebec, viewing this more often as a problem than anglophone schools in the same jurisdictions.

Computers and Their Use

The number of computers available in schools was found to vary quite widely and was strongly related to school size. Unfortunately, it was not possible to compute student-to-computer ratios with any accuracy because only broad ranges were available for both school size and number of computers. However, a number of other indicators of computer availability and use were available.

Chart 22 gives the views of principals on whether the school's capacity to provide instruction is limited by the number and quality of computers. Although the differences among jurisdictions appear relatively large, these are not statistically significant for the most part, and no geographical or language pattern is apparent.

Principals were asked a series of questions on the particular configuration in which computers can be found in their schools.

Chart 23 shows the percentage of schools reporting that they have a dedicated computer room where mathematics classes can be scheduled. Although such a configuration is commonly found, substantial jurisdictional differences are apparent. However, the most striking pattern is that based on language. Clearly the use of dedicated computer rooms is much less prevalent in francophone than in anglophone schools within the same jurisdictions.

As **Chart 24** indicates, having computers in mathematics classrooms is less prevalent than in dedicated computer rooms, with Nova Scotia standing out as using this configuration more and Quebec, Newfoundland and Labrador, and Prince Edward Island less than others. There seems to be no particular link between the patterns in these two charts, suggesting that there is no strong trade-off between one location and another. Indeed, the most prevalent location for computers in all jurisdictions was neither of these, but was the school library or resource centre.

Time

The length of the school year is generally a matter of provincial legislation. All schools within a jurisdiction would therefore be expected to report the same value for the number of instructional days in the school year. In most cases, there was a strong modal value (the value reported by the largest number of schools), indicating that schools typically reported the statutory value. The question was asked separately for the two age groups but no differences were observed in responses. The modal figures are reported in **Chart 25**.[3] This chart shows that most school years are close to 190 days, with variations from 178 to 197.

Despite the clear modes in most cases, considerable variation across schools was found in some jurisdictions. This suggests the possibility of some ambiguity in principals' interpretations of the actual requirement, even though the question clearly indicated that only the actual number of days students are in classes or exams should be reported.

The length of the school day was reported as five hours in all jurisdictions. Again, this is a statutory requirement and no variations would be expected within jurisdictions.

The number of teacher professional development days by jurisdiction is given in **Chart 26**. Again, because this is usually characteristic of a province rather than a school (because of regulations or collective agreements), strong modes were observed, with fewer variations than for the school year as a whole. What is obvious here is the variation across jurisdictions.

[3] Confidence intervals cannot be readily computed for modes. Strictly speaking, there should be no differences between schools in responses to questions requiring reporting of statutory values. Any differences observed are therefore likely due to varying interpretations of what was being asked.

In this case, Quebec again stands out with its 20 days being double that of any other jurisdiction.

Principals' estimates of the number of days lost due to the school being closed are shown in **Chart 27.**[4] In general, only a small number of days were reported lost, with a pattern of Eastern provinces showing more lost days than others.

The final question in this area had to do with length of class periods in the school for the two SAIP age groups. Median period lengths and interquartile ranges for the two age groups are shown in **Charts 28** and **29**. The main patterns here indicate longer periods for 16-year-olds and greater variation among jurisdictions for 13-year-olds. Quebec shows the greatest consistency by age, with exactly the same median for both age groups. However, this median varies by language, with Quebec francophone schools having longer periods than Quebec anglophone schools. In contrast, Ontario shows large variation by age but no variation by language.

Course Choice

As already indicated, mathematics for 16-year-olds tends to be organized into two or more streams in most jurisdictions. This raises the question of how decisions are made on student assignment to these streams. As **Chart 30** indicates, previous mathematics achievement is reported by a majority of schools in all populations as having a lot of influence on this decision. While substantial jurisdictional differences are apparent, the only obvious regional pattern is that this factor plays a smaller part in New Brunswick, Nova Scotia, and Prince Edward Island than in most other jurisdictions. Interestingly, the latter two provinces also reported high prevalence of three or more streams in mathematics.

Strong differences were found across jurisdictions in the proportions of schools reporting that students and parents have a lot of influence over course choice. The results for the influence of student wishes are given in **Chart 31**. A similar pattern was observed for parent wishes, indicating that principals may not have distinguished strongly between these two sources. Extremes in this case seem to exist among francophone schools, with those in Ontario and Manitoba reporting high and those in Quebec and New Brunswick relatively low student influence. The lowest overall level of student influence is in Quebec anglophone schools.

The influence of prerequisites or curricular requirements is more prevalent generally than that of student or parent wishes, as shown in **Chart 32**. Alberta, Ontario, and Quebec stand out as showing the greatest influence in this area.

Arrangements for Special-Needs Students

Mathematics is widely regarded as an area in which wide variations in student achievement are found, with some students excelling and others having difficulty. A number of questions were therefore asked about arrangements made for students at these extremes. **Chart 33** shows the percentage of schools reporting that they provide extra support for struggling students (remedial support) and enrichment programs for gifted students in mathematics. Large differences occur between the two areas, with remedial support through extra teaching being provided much more frequently than enrichment in almost all jurisdictions. Francophone schools in Manitoba and Nova Scotia were exceptions to the pattern, with relatively low levels of support being provided in both categories.

Schools reported a wide variety of specific types of support for both of the extreme groups of students. Rather than presenting a lengthy series of charts, the results in this area are described in general terms.

Extra help outside of regular school hours was the most frequently reported remedial activity. It is notable, however, that this type of activity was much less prevalent in three of the five francophone jurisdictions (Manitoba, Ontario, and Nova Scotia) than elsewhere and than in anglophone schools in the same jurisdictions. Extra help was also less widely available in schools in the territories than in provincial anglophone jurisdictions.

Separate or modified courses for struggling students were reported by a majority of schools in most jurisdictions. Language differences were even more pronounced here, with modified courses being much more prevalent in anglophone than in francophone schools in all cases. There was much less widespread availability of such courses for gifted students throughout, with jurisdictional differences showing no obvious pattern.

Principals reported somewhat limited availability of advanced placement courses for gifted students, with British Columbia, Quebec (both languages), Nova Scotia French, and Newfoundland and Labrador reporting these more often than other jurisdictions. A specific form of advanced placement, the International Baccalaureate, was reported infrequently, with about 13% of Quebec francophone and 5% each of Quebec anglophone and Alberta schools being the highest levels.

Individualized program plans are being widely promoted in most areas as a means of dealing with individual differences. This form of programming for struggling students was also reported by a majority of schools in most jurisdictions.

[4] The bars on Charts 27, 28, and 29 represent "interquartile ranges" or the difference between the 25th - 50th and 50th - 75th percentile ranks in school responses. While giving a general indication of variation between schools within a population, these cannot be interpreted as confidence intervals.

Views on School Learning and Support for School

Principals were asked a number of questions about their views on factors influencing student learning, whether or not high school students should be streamed, and the state of staff morale and support for the school.

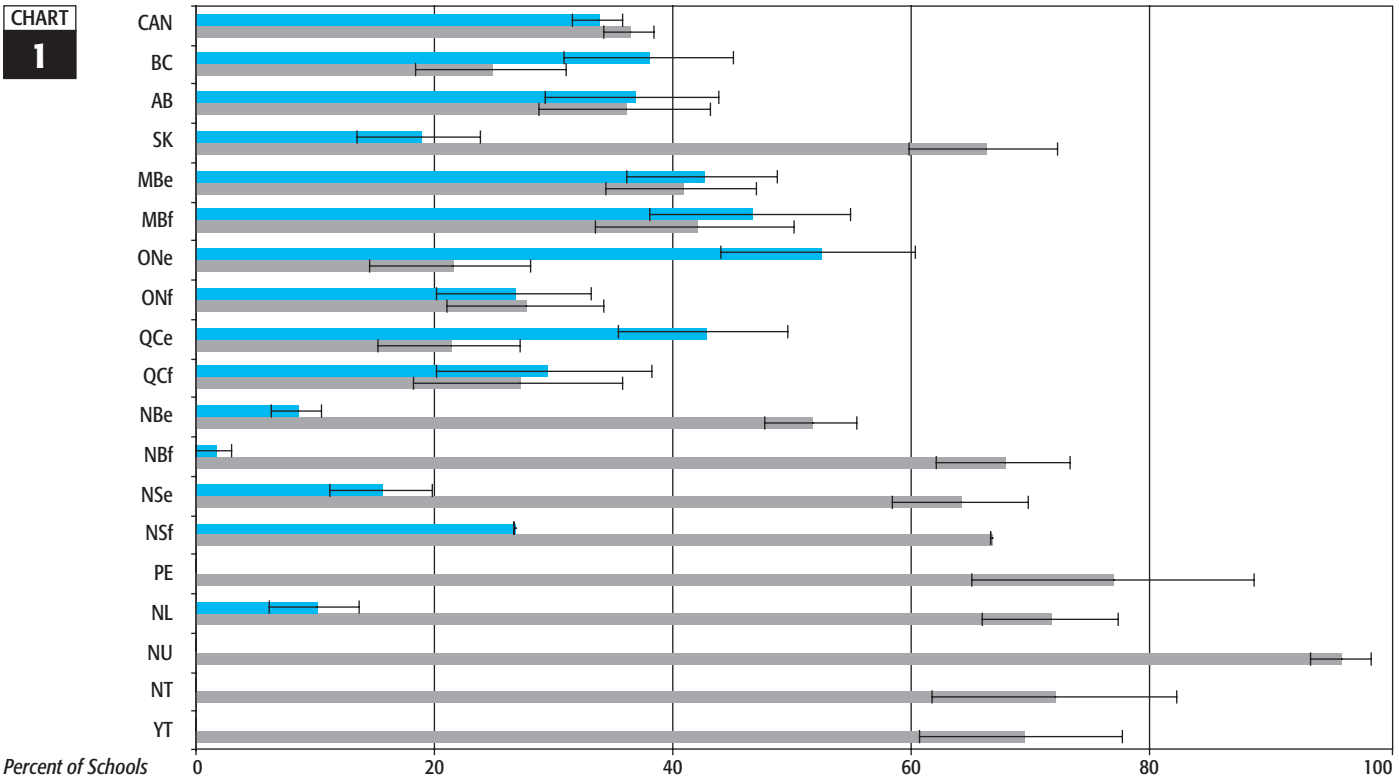
There was agreement throughout (more than 50% in all cases) that there are limits to what a school can accomplish because home background has a large influence on achievement. Nevertheless, there was much stronger agreement that students can achieve at high levels if they work hard, if they are taught well, and if there are adaptations to meet special needs. (These were separate items, with agreement in the 90% range in all cases.)

As **Chart 34** indicates, more than 70% of principals in all jurisdictions, with the exception of Prince Edward Island, agreed with the proposition that high school students should be streamed into different programs based on their abilities. There was a pattern of stronger agreement among francophone principals than among anglophones in the same jurisdictions, with the exception of those in Nova Scotia.

Finally, principals tended to give strong positive support (more than 80% in most cases) to statements about school spirit, staff morale, pride in the school, and community support for the school. Quebec francophone principals and those in territorial schools were less positive than others about school spirit and community support, although a majority agreed with the propositions in all cases.

Percentage of schools in rural/small towns and medium/large cities

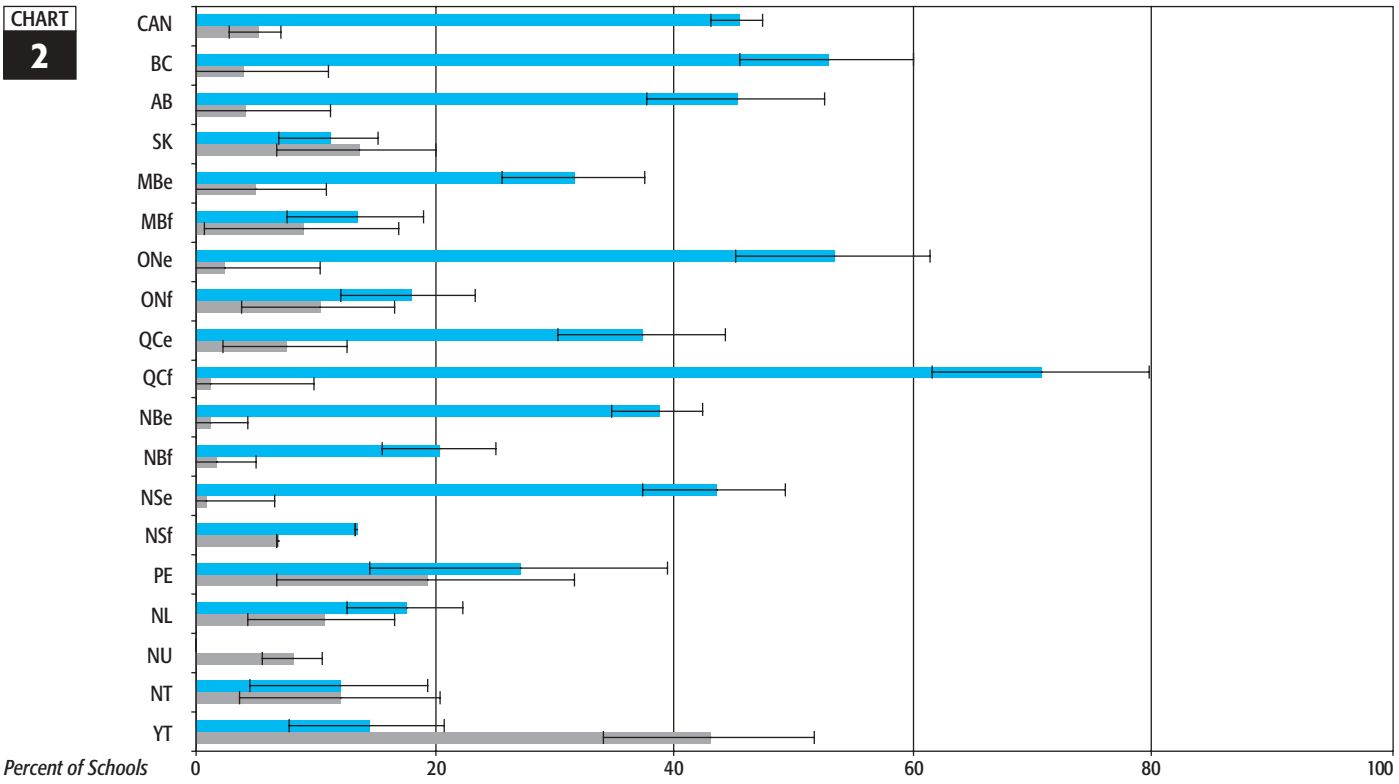
CHART 1



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Medium/Large City	34	38	37	19	43	47	52	27	43	29	8	2	15	27	0	10	0	0	0
Rural/SmallTown	36	25	36	66	41	42	21	28	21	27	52	68	64	67	77	72	96	72	69

Percentage of schools with fewer than 100 or more than 500 students

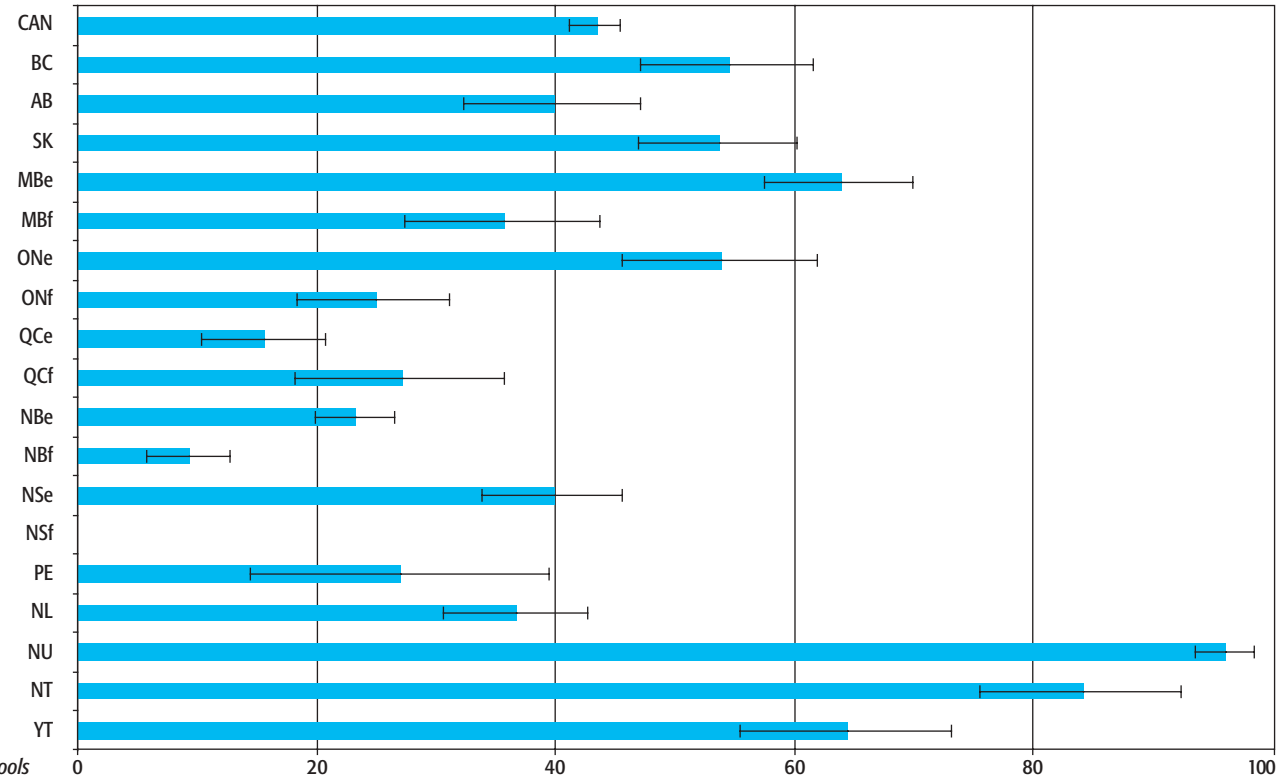
CHART 2



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
500+	45	53	45	11	32	13	53	18	37	71	39	20	43	13	27	17	0	12	14
0–99	5	4	4	13	5	9	2	10	7	1	1	2	1	7	19	10	8	12	43

Percentage of schools with more than 25% of students living within walking distance

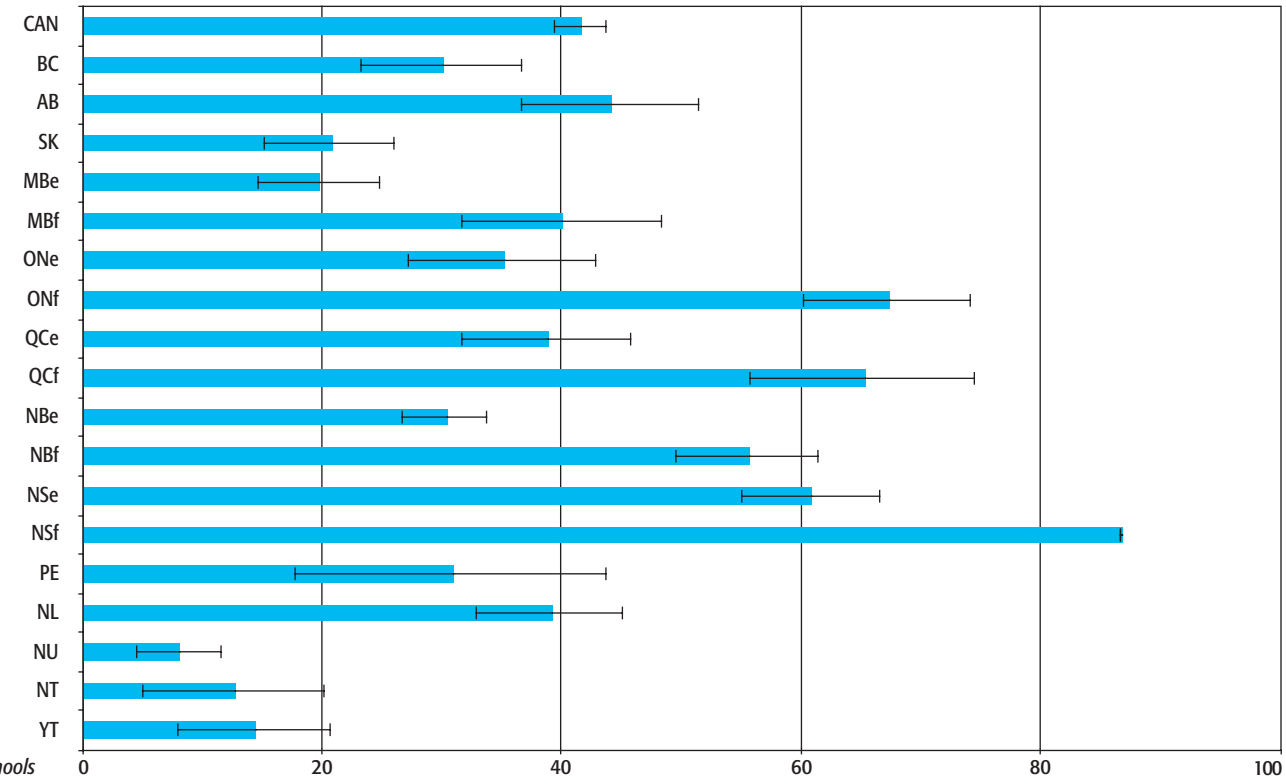
CHART 3



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
More than 25%	43	54	40	54	64	36	54	25	16	27	23	9	40	0	27	37	96	84	64

Percentage of schools with schedules substantially or severely restricted by student travel requirements

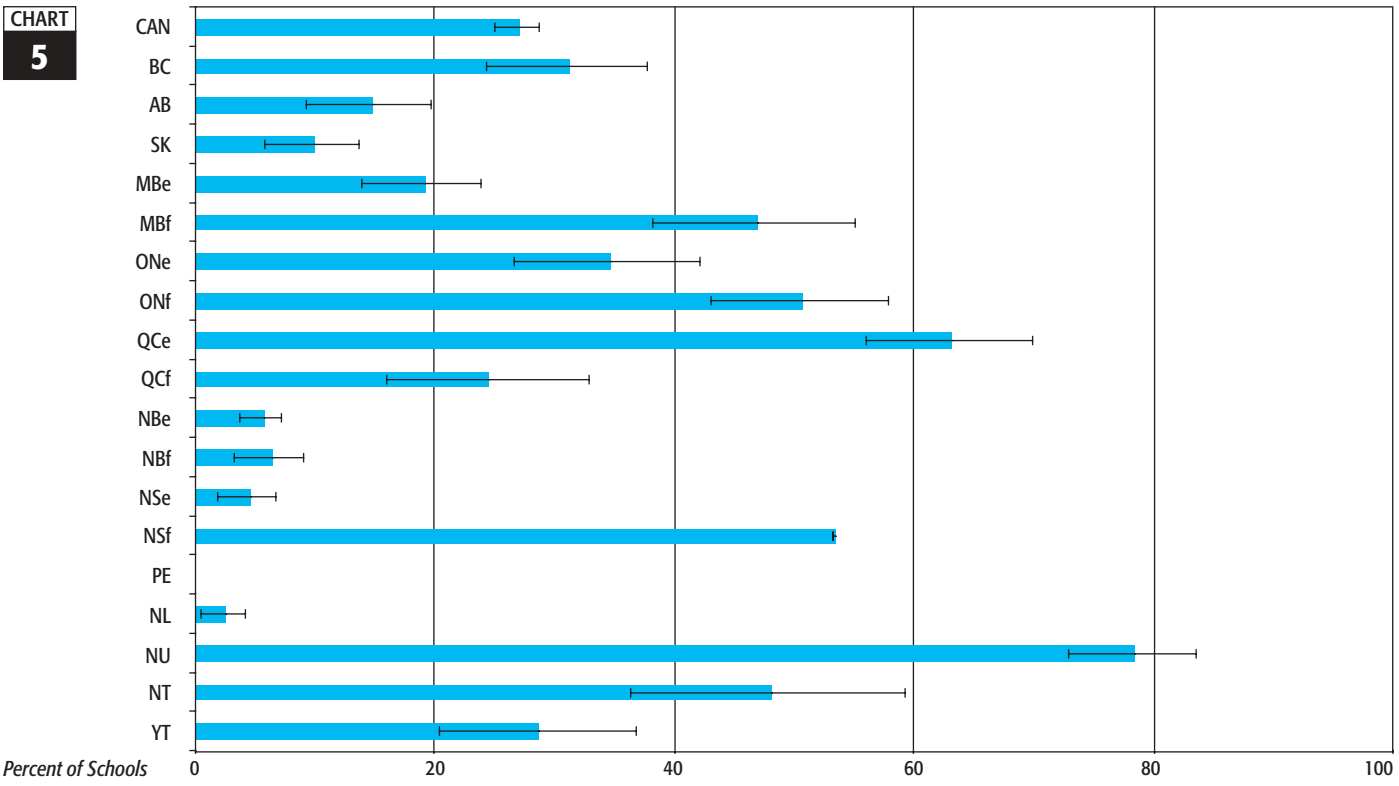
CHART 4



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Substantially/Severely	42	30	44	21	20	40	35	67	39	65	30	56	61	87	31	39	8	13	14

Percentage of schools having 10% or more of students with first language other than the language of the school

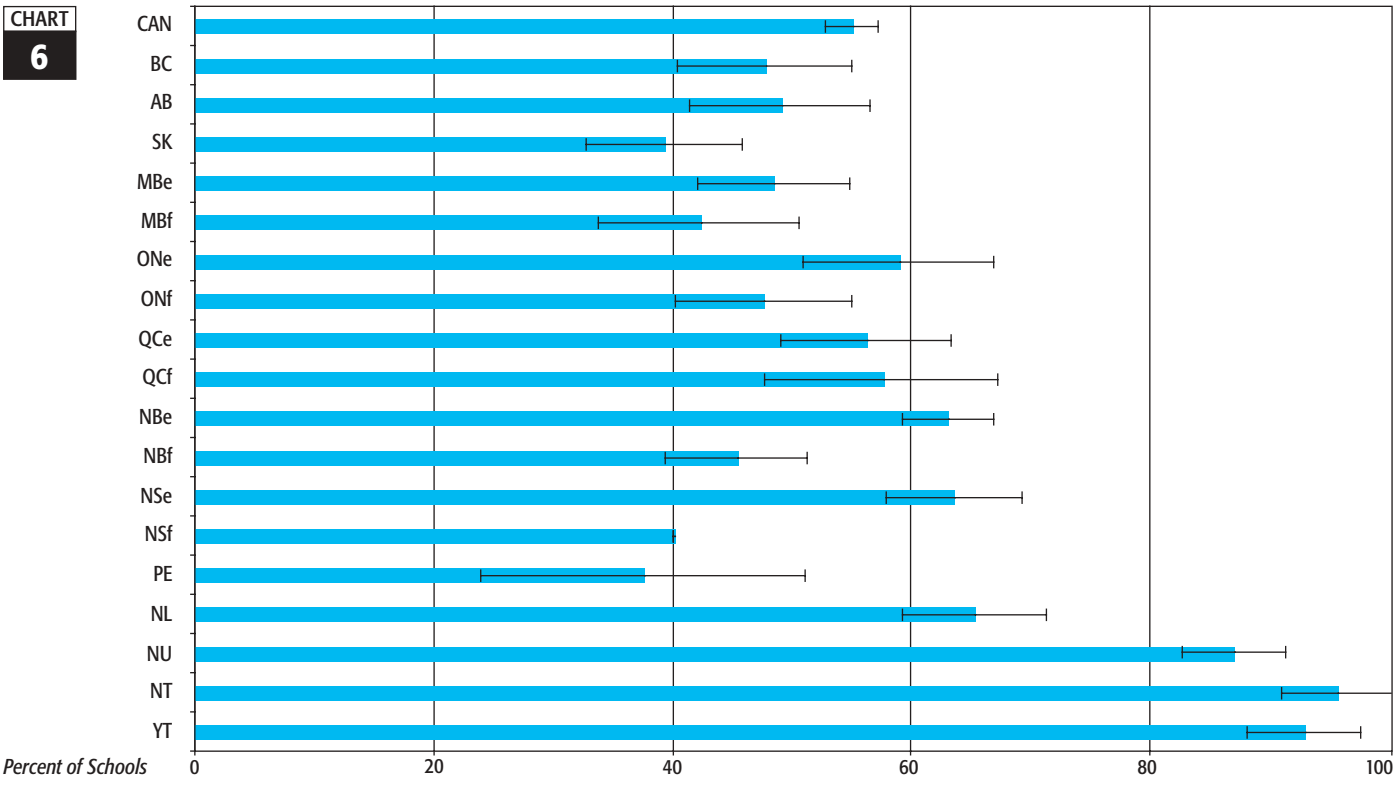
CHART 5



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
10% or more	27	31	14	10	19	47	34	50	63	24	5	6	4	53	0	2	78	48	29

Percentage of schools with 10% or more of students having learning problems needing special attention

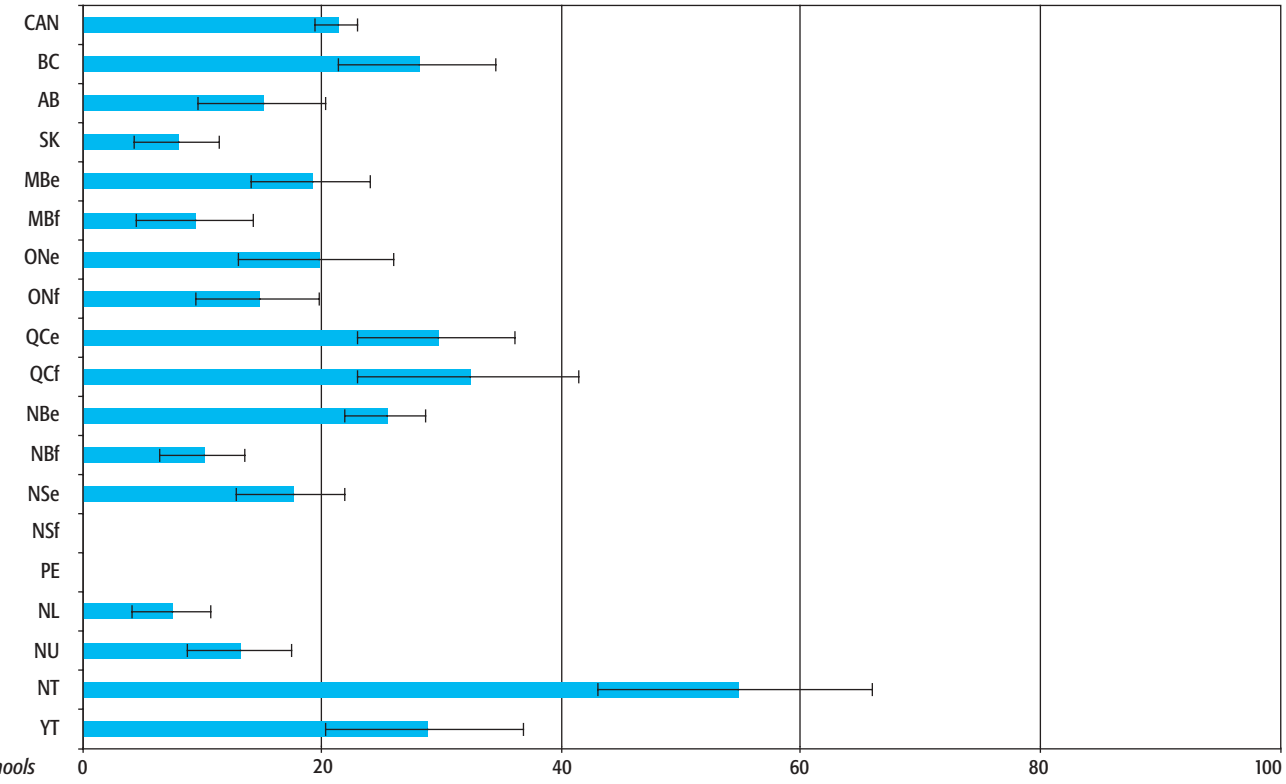
CHART 6



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
10% or more	55	48	49	39	48	42	59	48	56	57	63	45	64	40	38	65	87	96	93

Percentage of schools with more than 25% of students from single-parent families

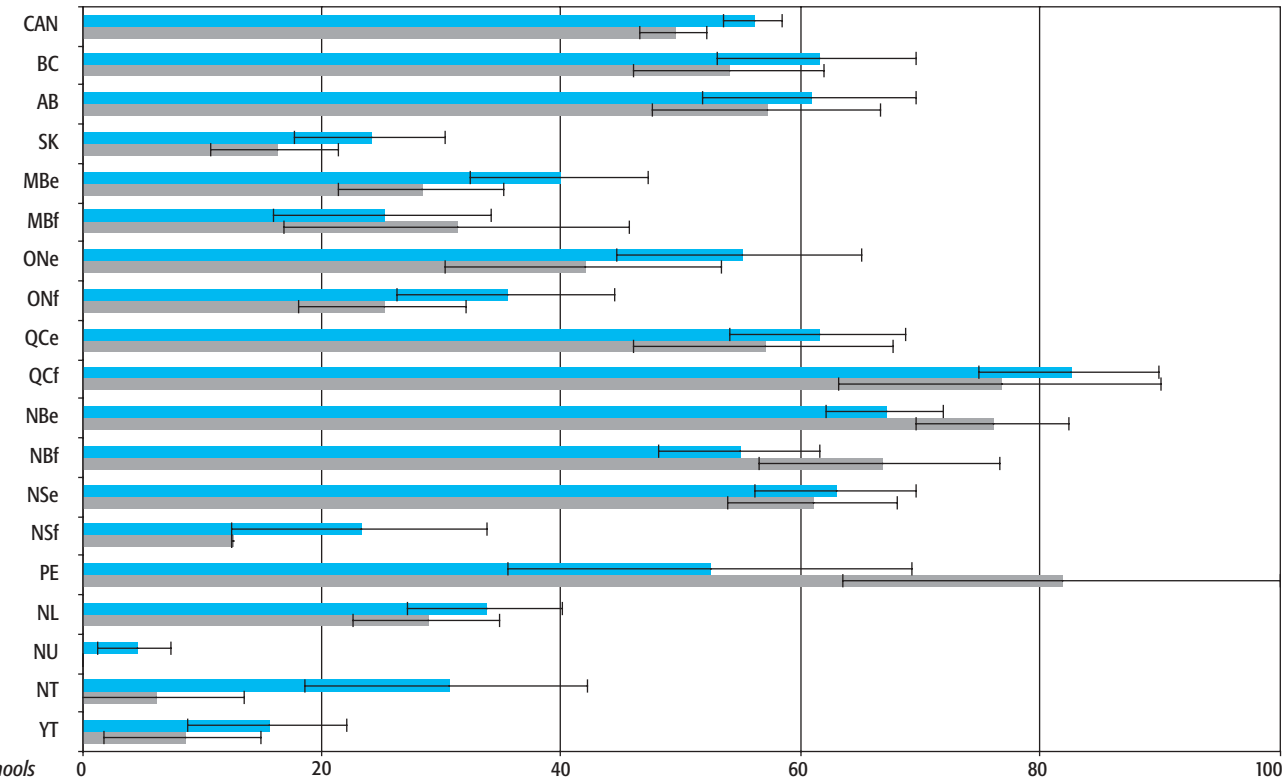
CHART 7



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
More than 25%	21	28	15	8	19	9	20	15	30	32	25	10	17	0	0	7	13	55	29

Percentage of schools with average class size of 25 or more students

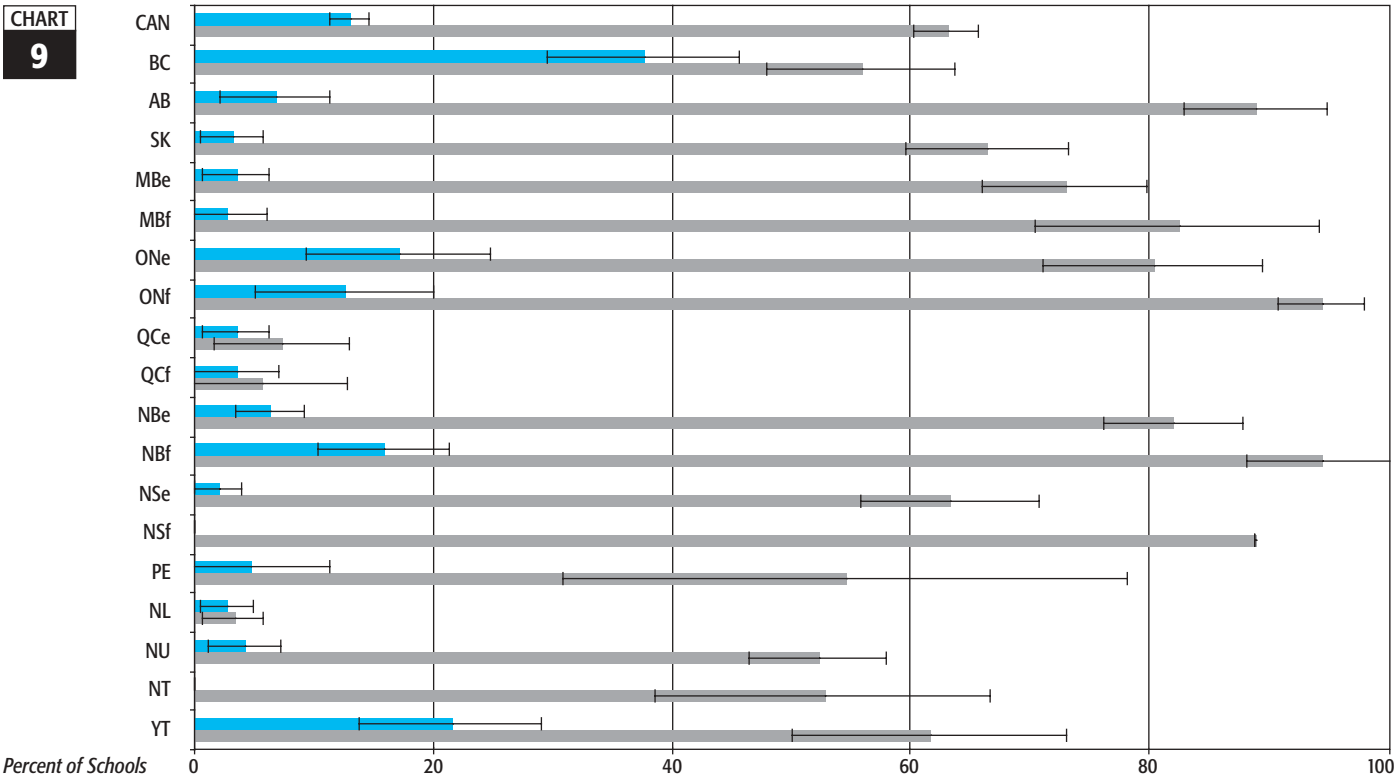
CHART 8



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Math 13 Years	56	61	61	24	40	25	55	35	61	83	67	55	63	23	52	34	4	30	15
Math 16 Years	49	54	57	16	28	31	42	25	57	77	76	67	61	13	82	29	0	6	8

Percentage of schools reporting more than 50% of courses semestered

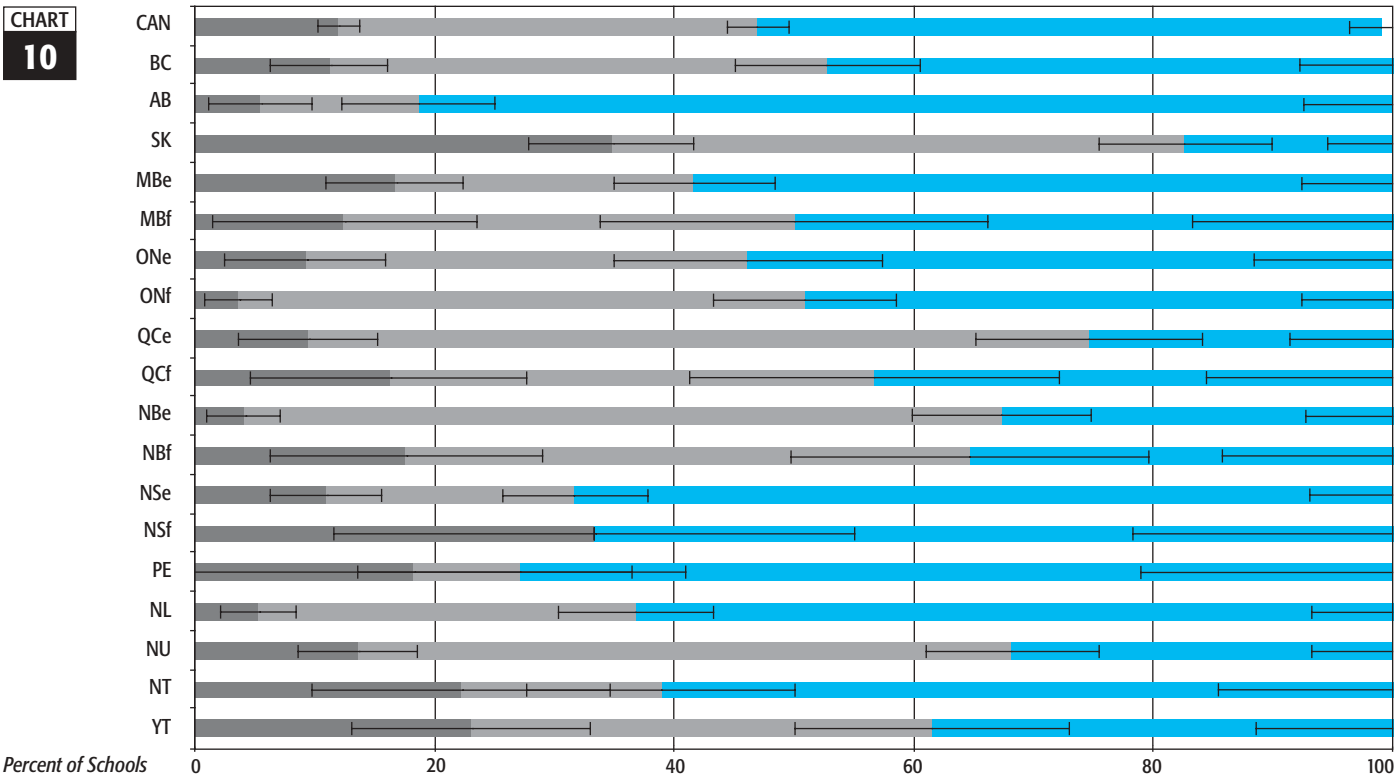
CHART 9



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	13	38	7	3	3	3	17	13	3	3	6	16	2	0	5	3	4	0	21
16 Years	63	56	89	66	73	82	80	94	7	6	82	94	63	89	55	3	52	53	62

Percentage of schools reporting one, two, or three or more streams for mathematics at 16 years

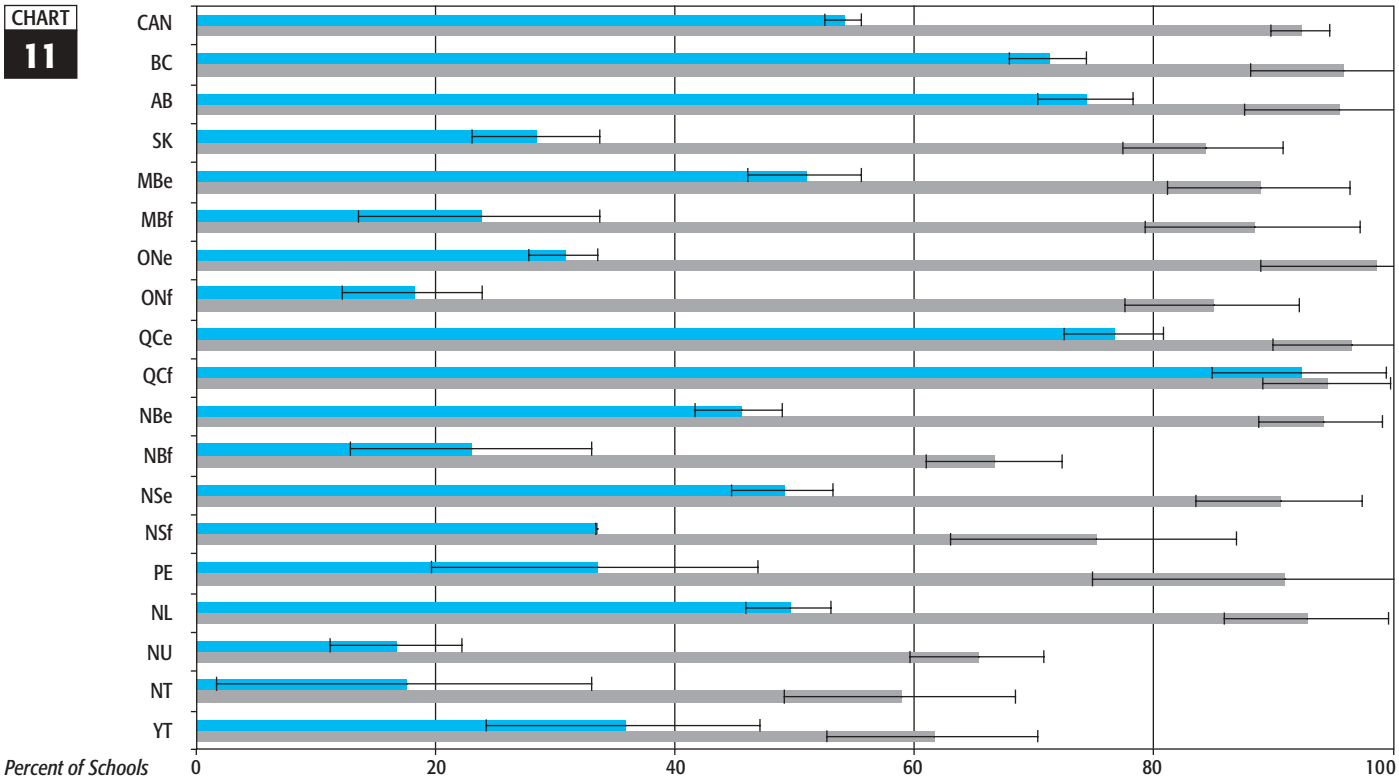
CHART 10



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Three or more	52	47	81	17	58	50	54	49	25	43	33	35	68	67	73	63	32	61	38
Two	35	42	13	48	25	38	37	47	65	41	63	47	21	0	9	32	55	17	38
One	12	11	5	35	17	13	9	4	10	16	4	18	11	33	18	5	14	22	23

Percentage of schools in which mathematics is taught mainly by subject teachers specializing in mathematics

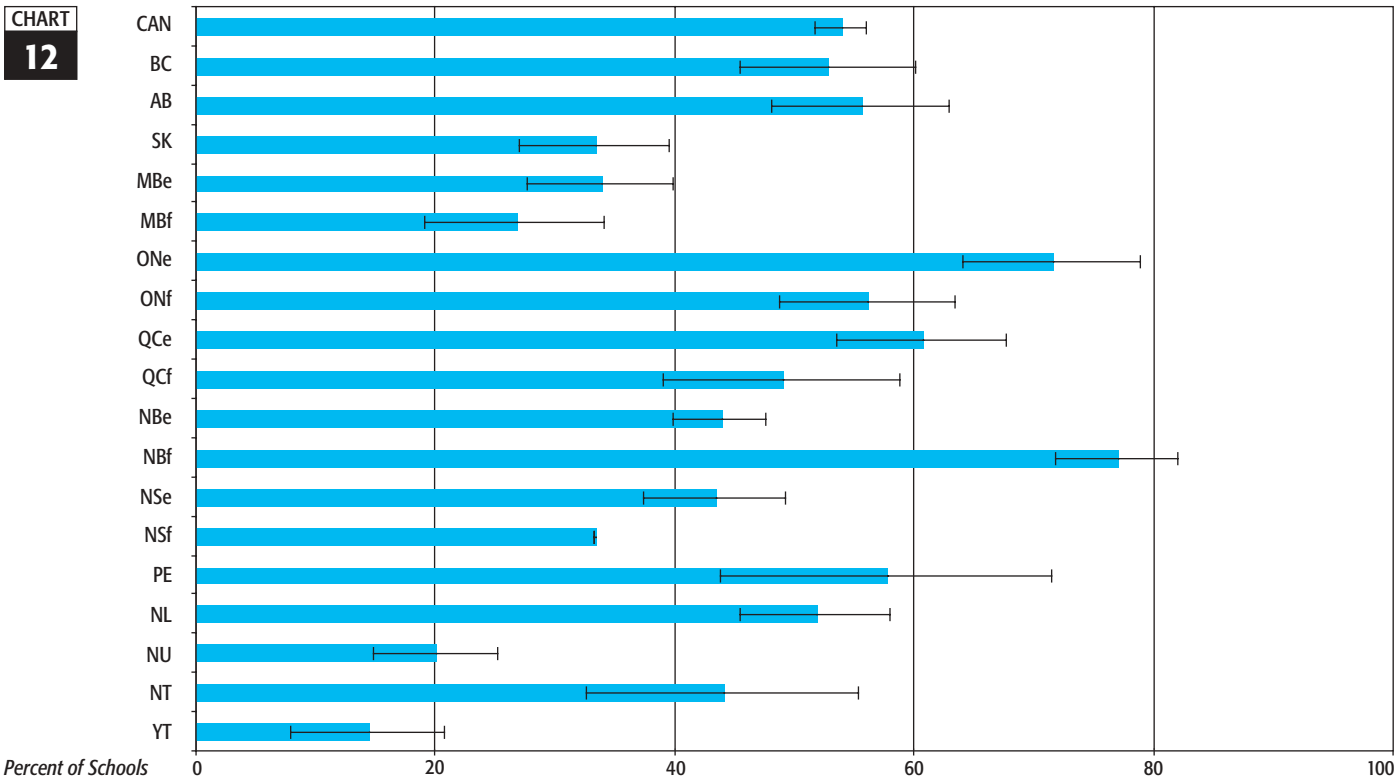
CHART 11



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	54	71	74	28	51	24	31	18	77	92	45	23	49	33	33	50	17	17	36
16 Years	92	96	96	84	89	88	98	85	96	94	94	67	90	75	91	93	65	59	62

Percentage of schools with a written policy on homework

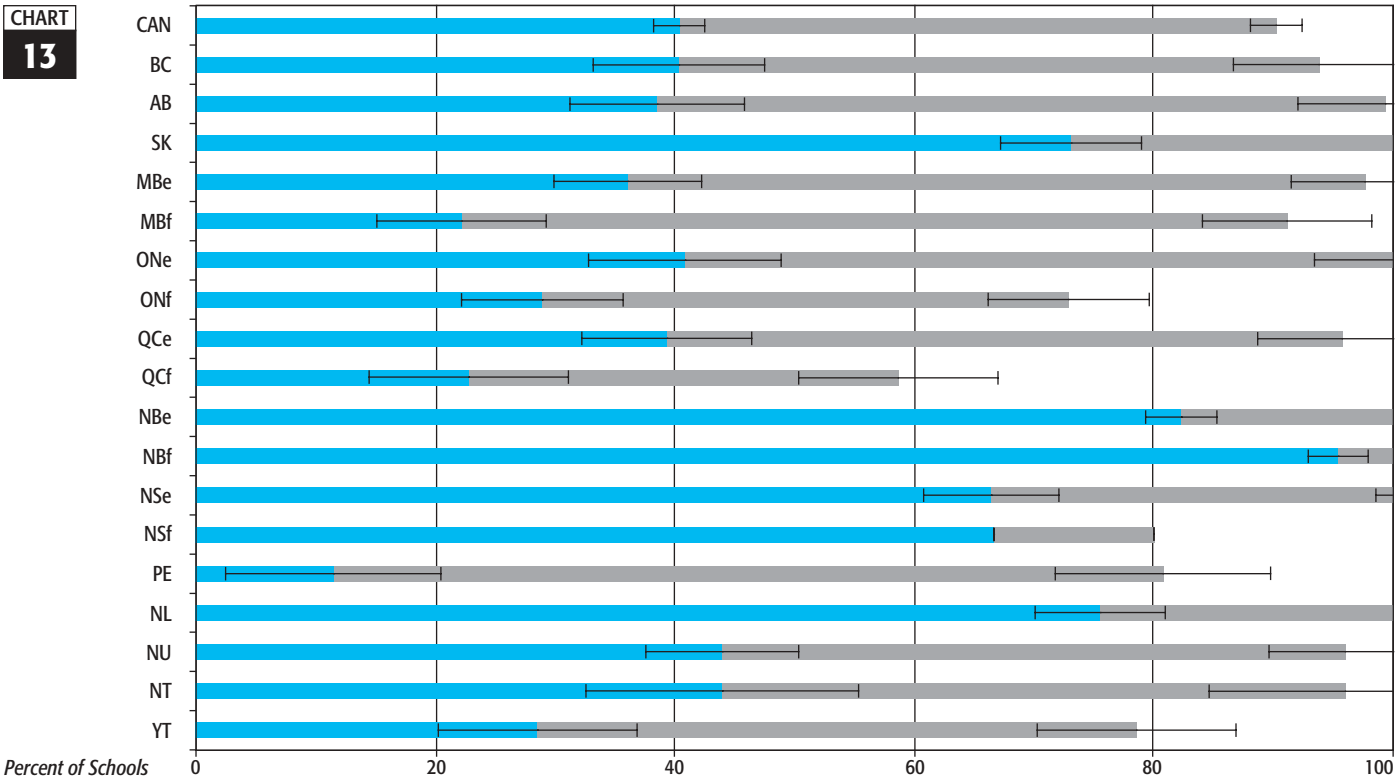
CHART 12



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
% Yes	54	53	56	33	34	27	72	56	61	49	44	77	43	33	58	52	20	44	14

Percentage of schools reporting district and principal as primary influence on hiring teachers

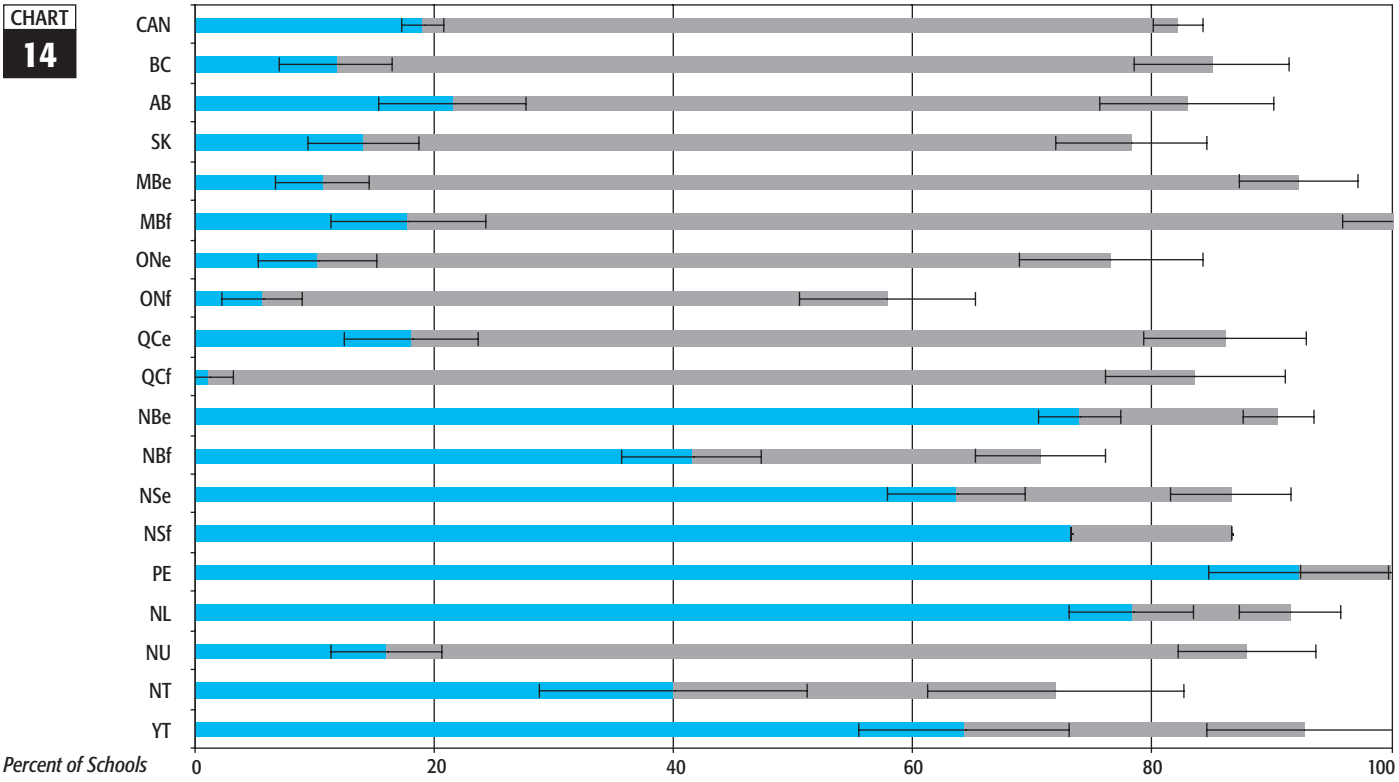
CHART 13



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Principal	50	53	61	35	62	69	61	44	56	36	25	9	38	13	69	31	52	52	50
District	40	40	39	73	36	22	41	29	39	23	82	95	66	67	12	76	44	44	29

Percentage of schools reporting jurisdictional and school decisions on textbooks

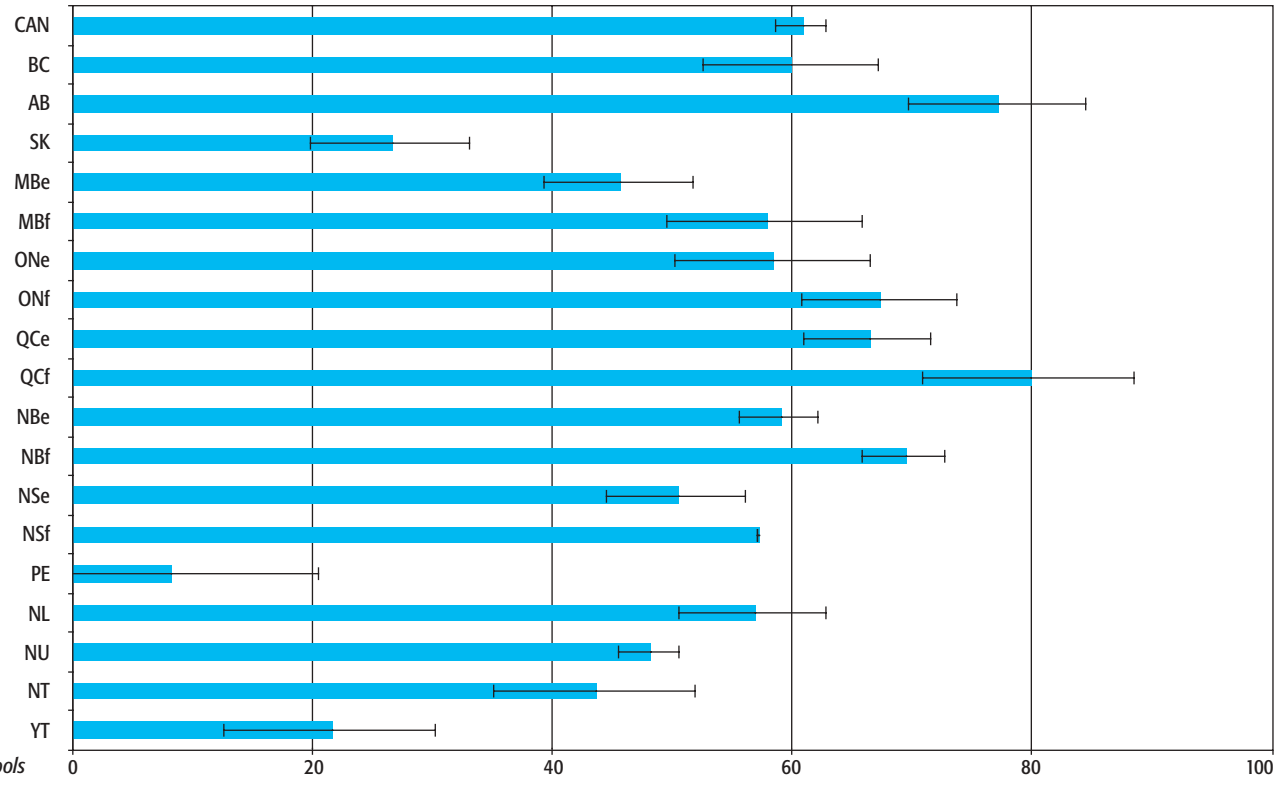
CHART 14



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
School	63	73	61	64	82	84	66	52	68	83	17	29	23	13	8	13	72	32	29
Jurisdiction	19	12	22	14	11	18	10	6	18	1	74	42	64	73	92	78	16	40	64

Percentage of schools reporting some or a lot of influence from external tests, examinations, or standards on school activities and programs

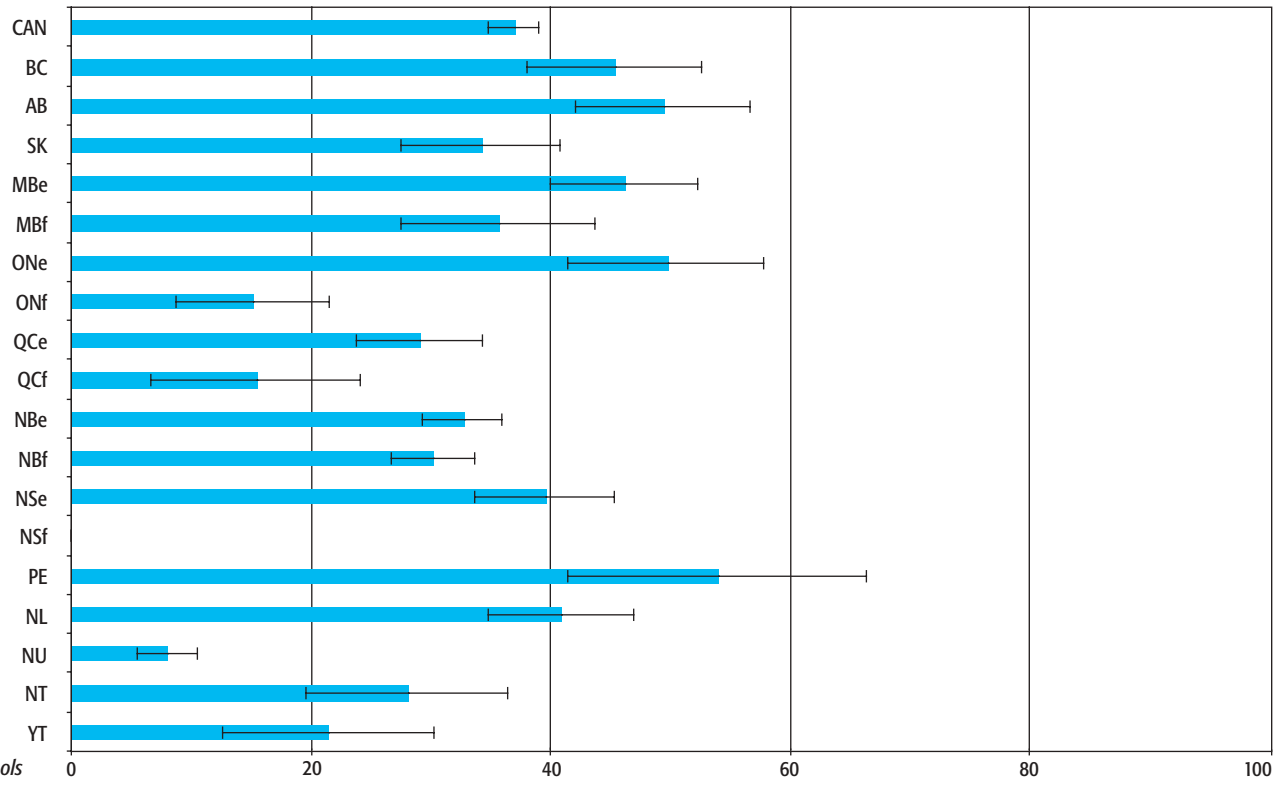
CHART 15



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Some or a lot	61	60	77	26	46	58	58	67	66	80	59	69	50	57	8	57	48	43	21

Percentage of schools reporting that parents interact a lot with staff on matters affecting their own children

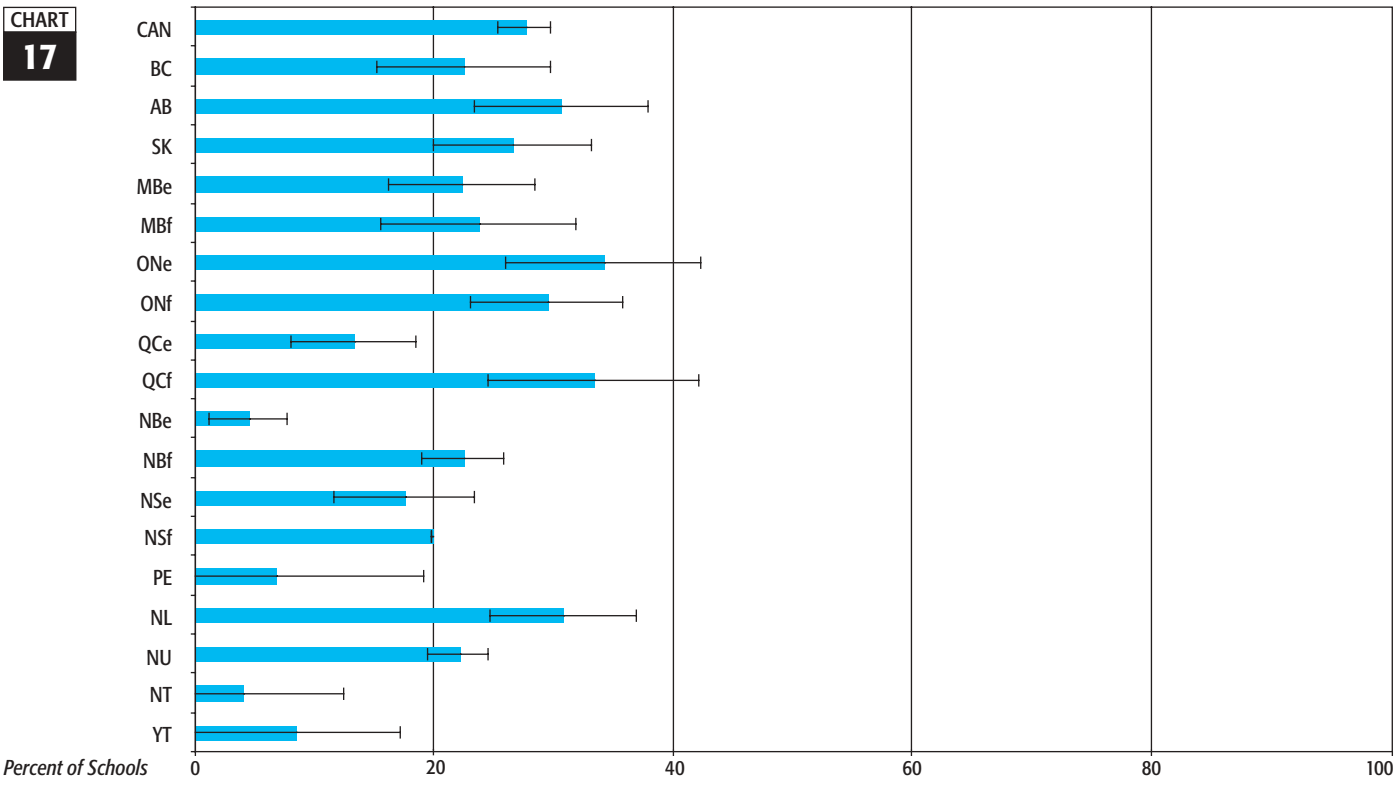
CHART 16



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
A lot	37	45	49	34	46	36	50	15	29	15	33	30	39	0	54	41	8	28	21

Percentage of schools reporting that parents help a lot with raising funds for the school

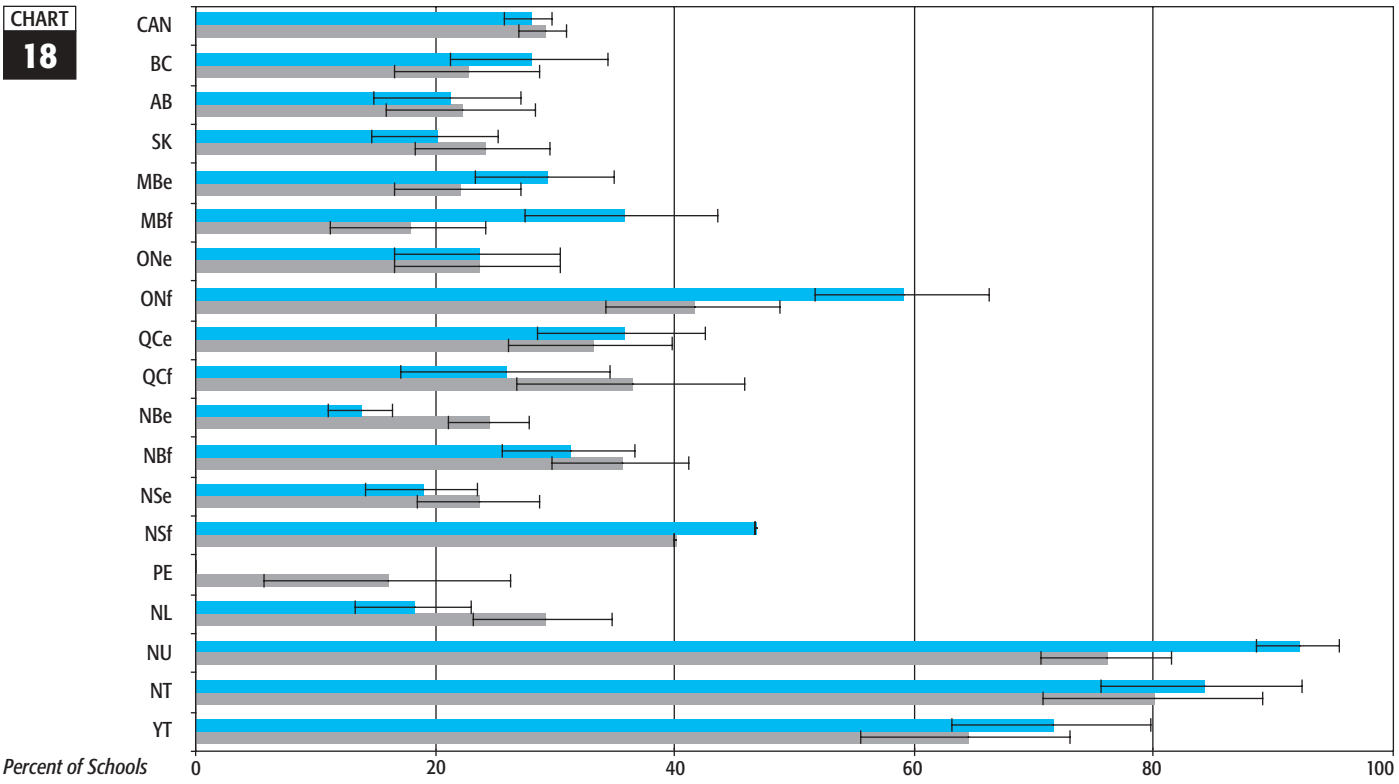
CHART 17



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
A lot	28	22	31	27	22	24	34	29	13	33	4	22	17	20	7	31	22	4	8

Percentage of schools reporting instruction limited some or a lot by community conditions or lack of parental support

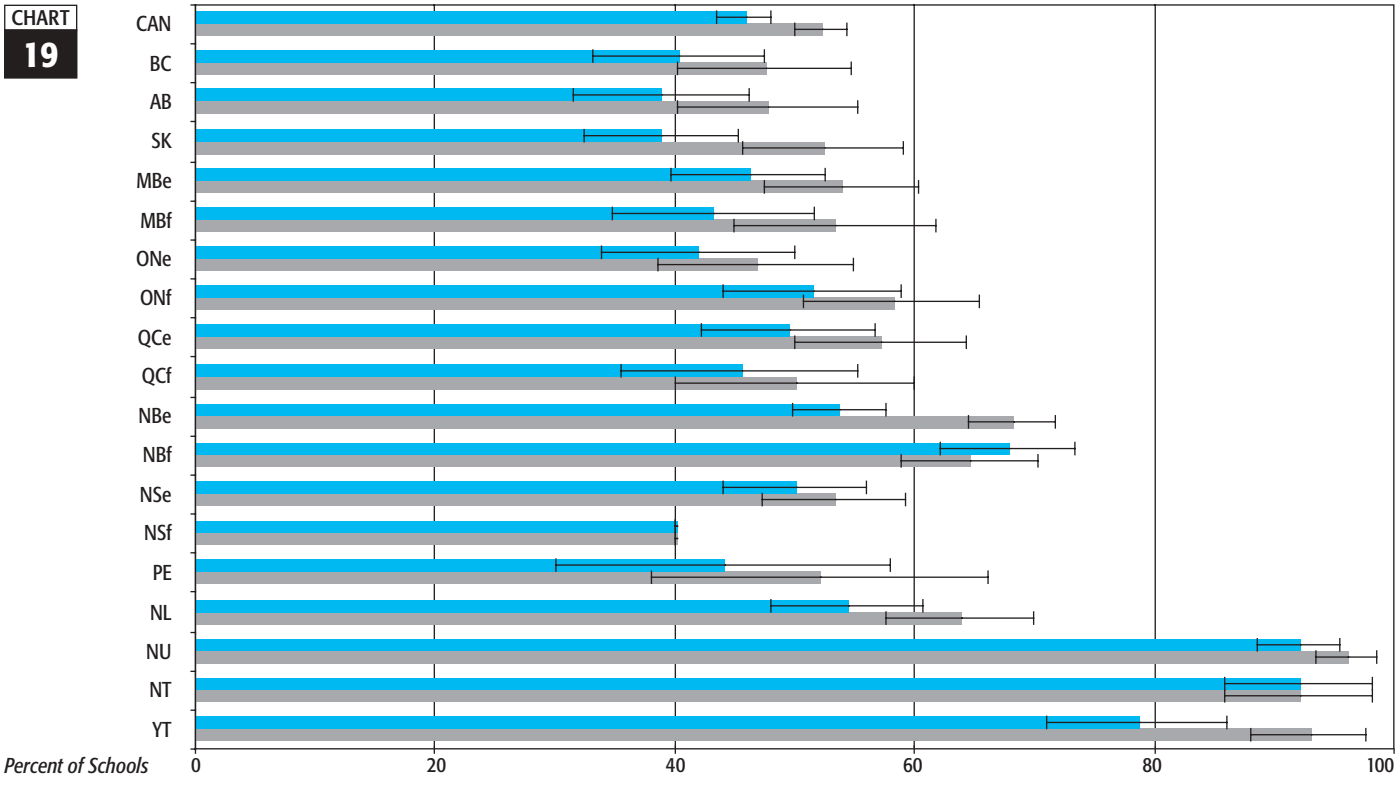
CHART 18



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Community conditions	28	28	21	20	29	36	24	59	36	26	14	31	19	47	0	18	92	84	71
Parental support	29	23	22	24	22	18	24	42	33	36	24	35	24	40	16	29	76	80	64

Percentage of schools reporting instruction limited some or a lot by student home background and range of student abilities

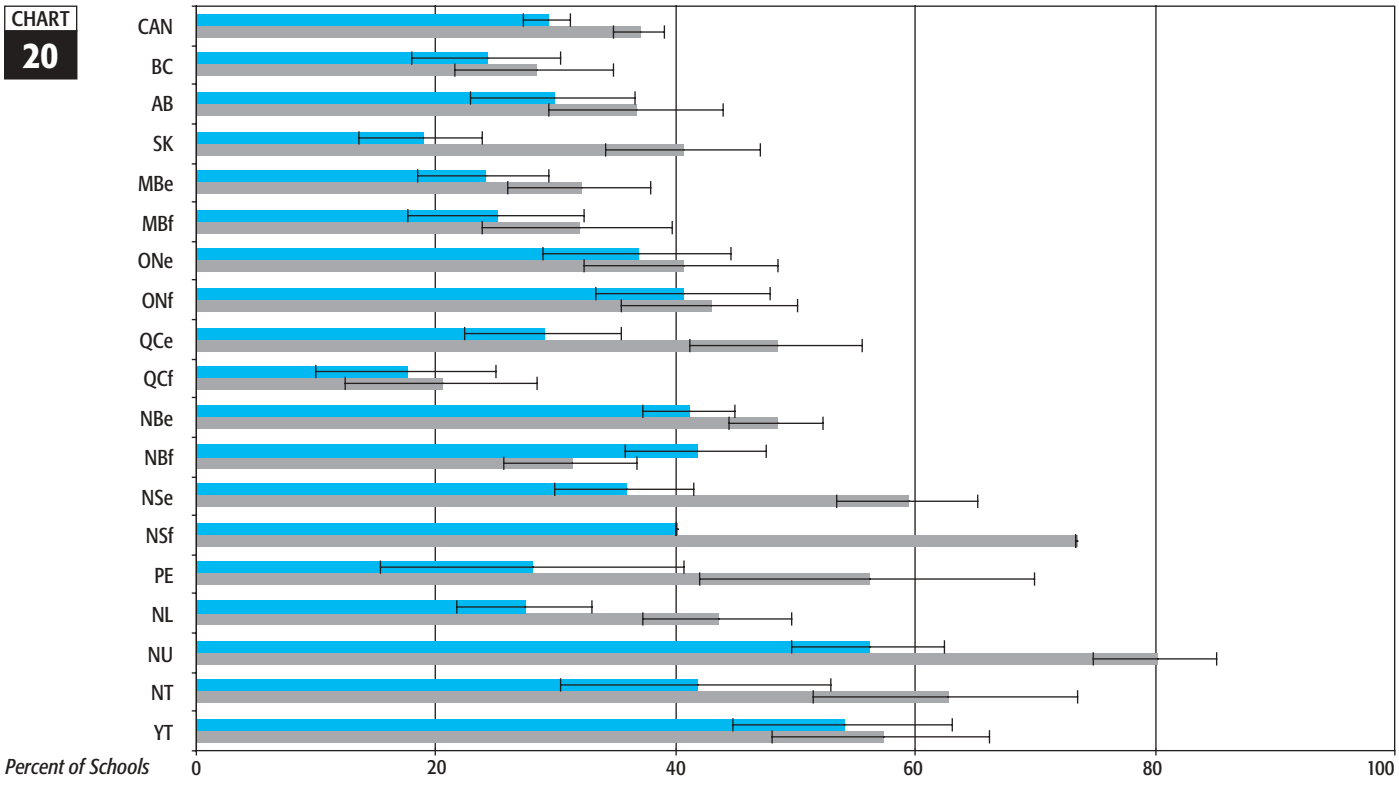
CHART 19



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Home background	46	40	39	39	46	43	42	51	49	45	54	68	50	40	44	54	92	92	79
Range of student abilities	52	47	48	52	54	53	47	58	57	50	68	65	53	40	52	64	96	92	93

Percentage of schools reporting instruction limited some or a lot by shortage of specialists

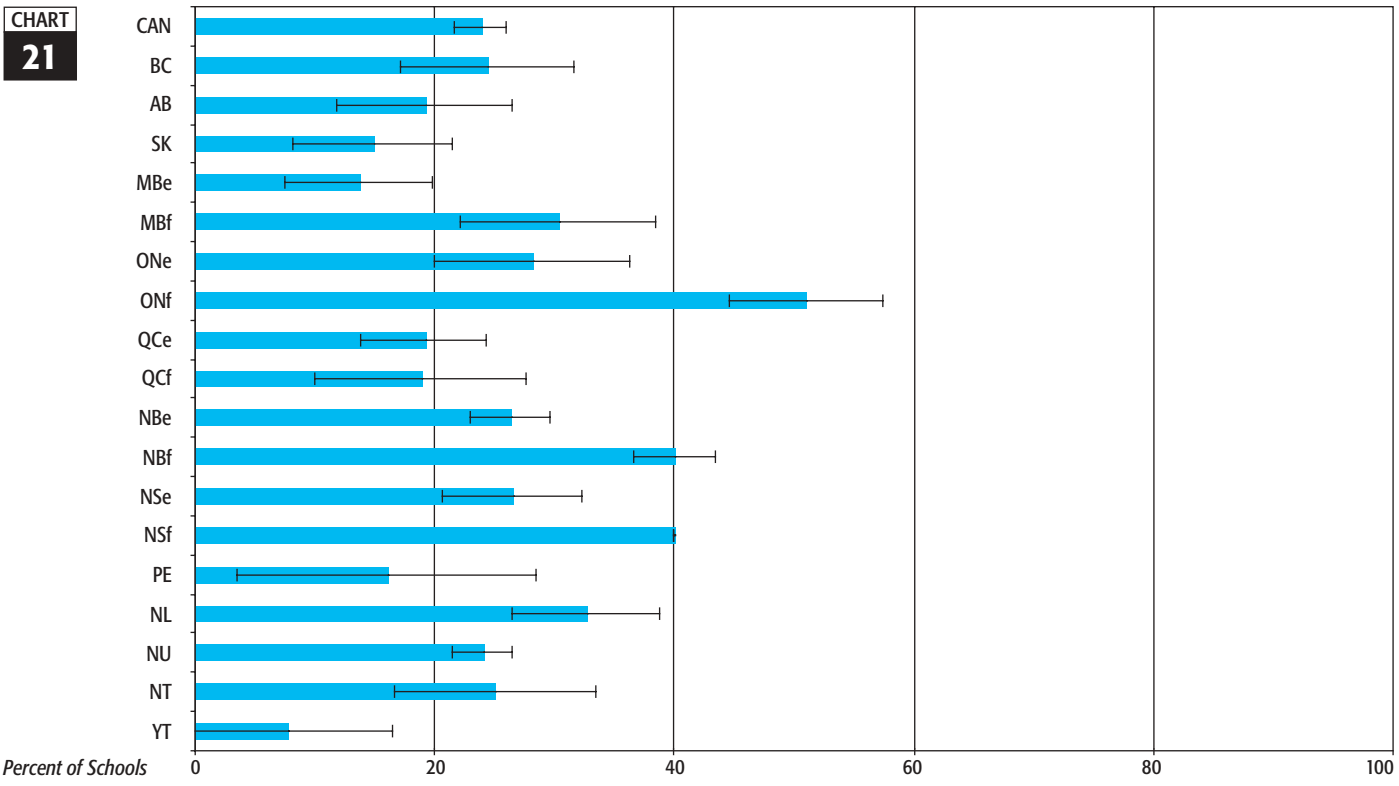
CHART 20



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Mathematics	29	24	30	19	24	25	37	41	29	17	41	42	36	40	28	27	56	42	54
Other	37	28	37	41	32	32	40	43	48	20	48	31	59	73	56	43	80	63	57

Percentage of schools reporting instruction limited some or a lot by lack of manipulative materials for mathematics

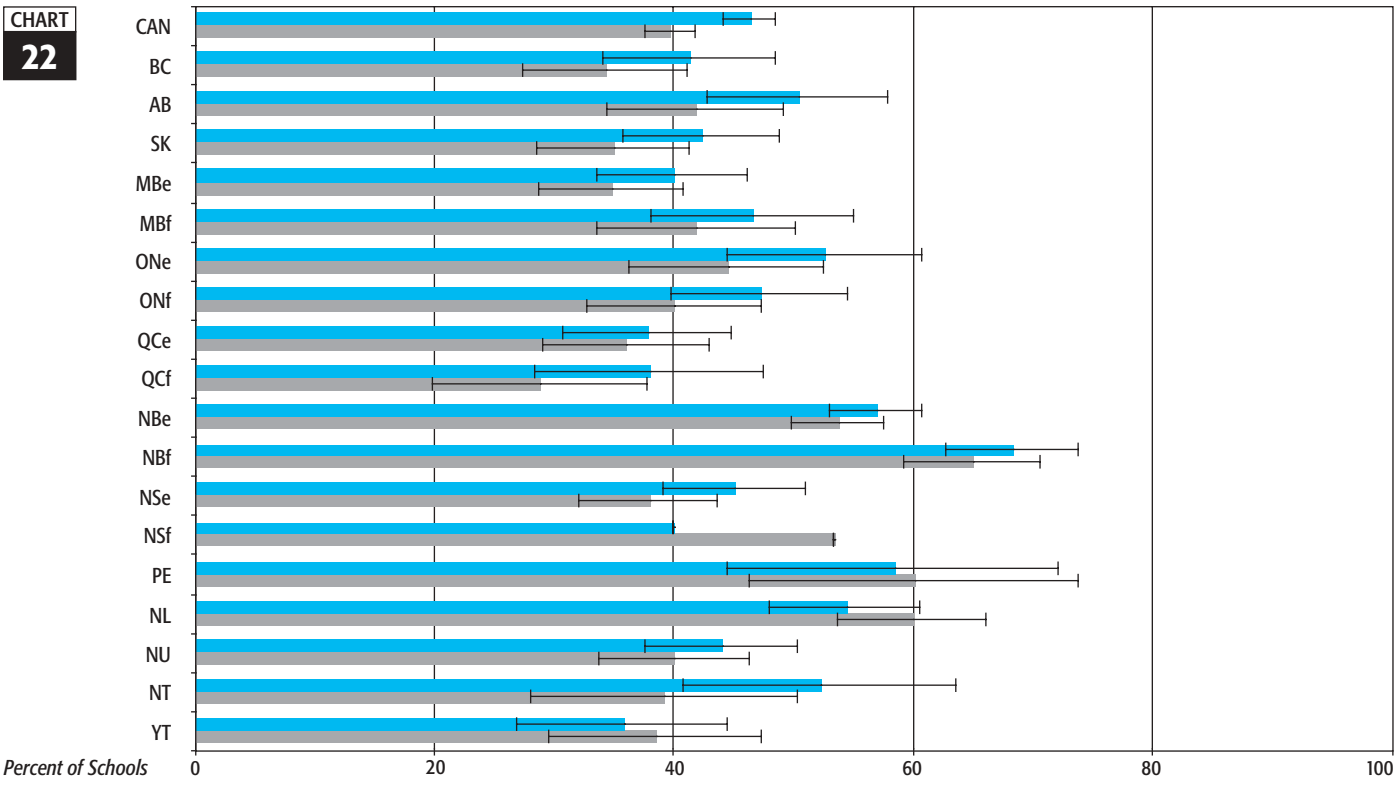
CHART 21



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Some or a lot	24	24	19	15	14	30	28	51	19	19	26	40	26	40	16	33	24	25	8

Percentage of schools reporting instruction limited some or a lot by number and quality of computers

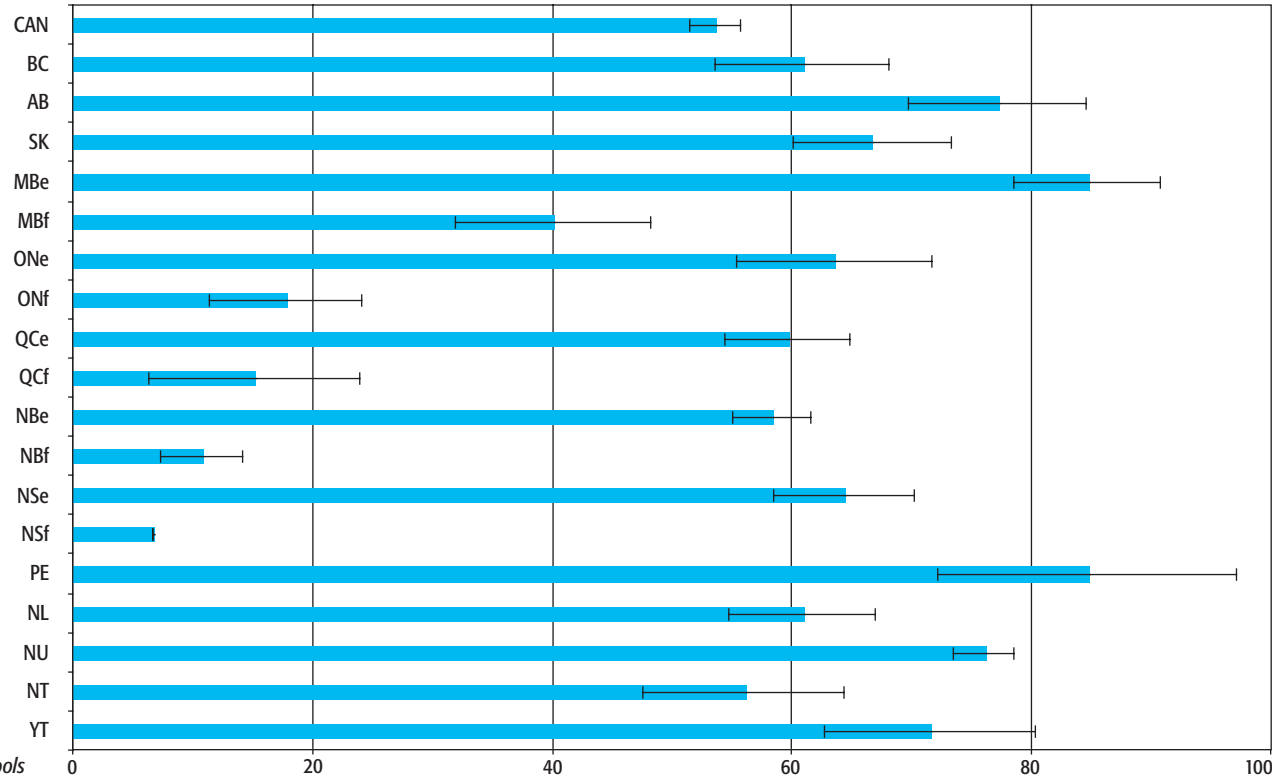
CHART 22



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Number	46	41	50	42	40	47	53	47	38	38	57	68	45	40	58	54	44	52	36
Quality	40	34	42	35	35	42	44	40	36	29	54	65	38	53	60	60	40	39	38

Percentage of schools reporting having dedicated computer rooms where mathematics classes can be scheduled

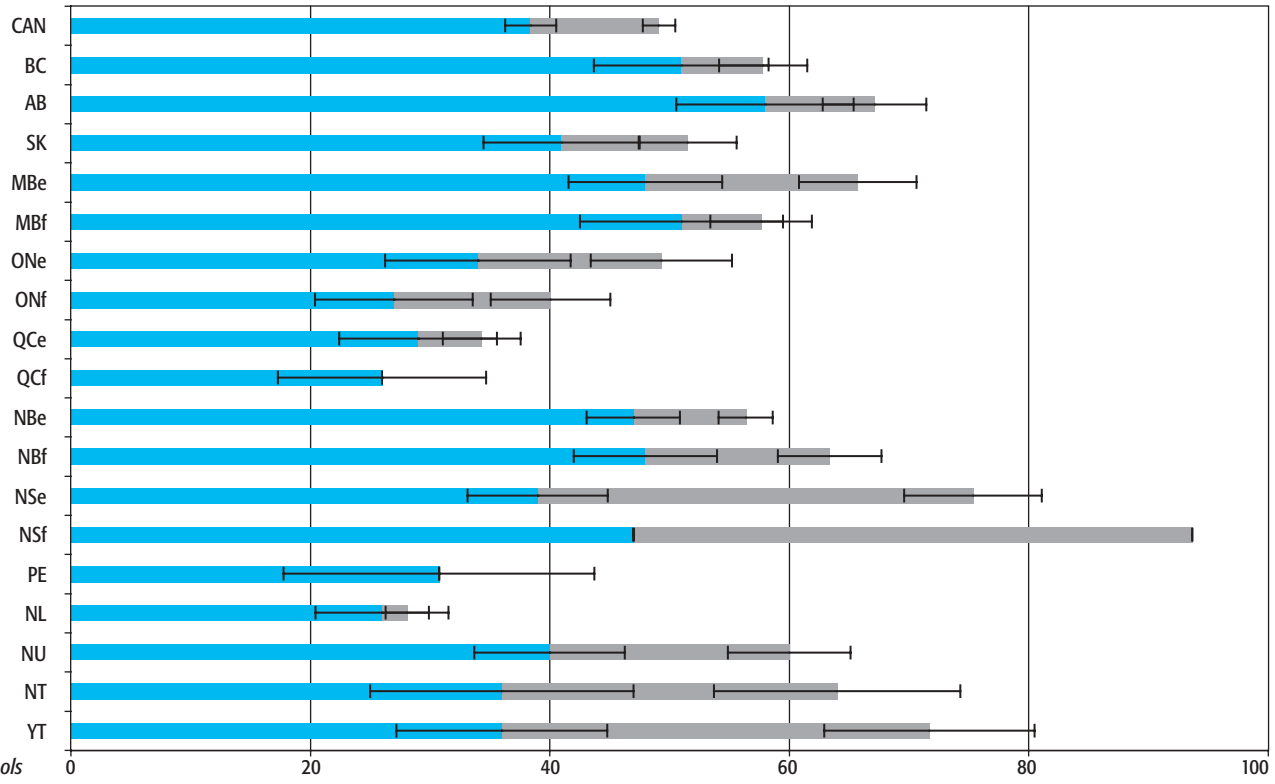
CHART 23



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
% Yes	54	61	77	67	85	40	64	18	60	15	58	11	64	7	85	61	76	56	71

Percentage of schools reporting one or more computers in all or most mathematics classrooms

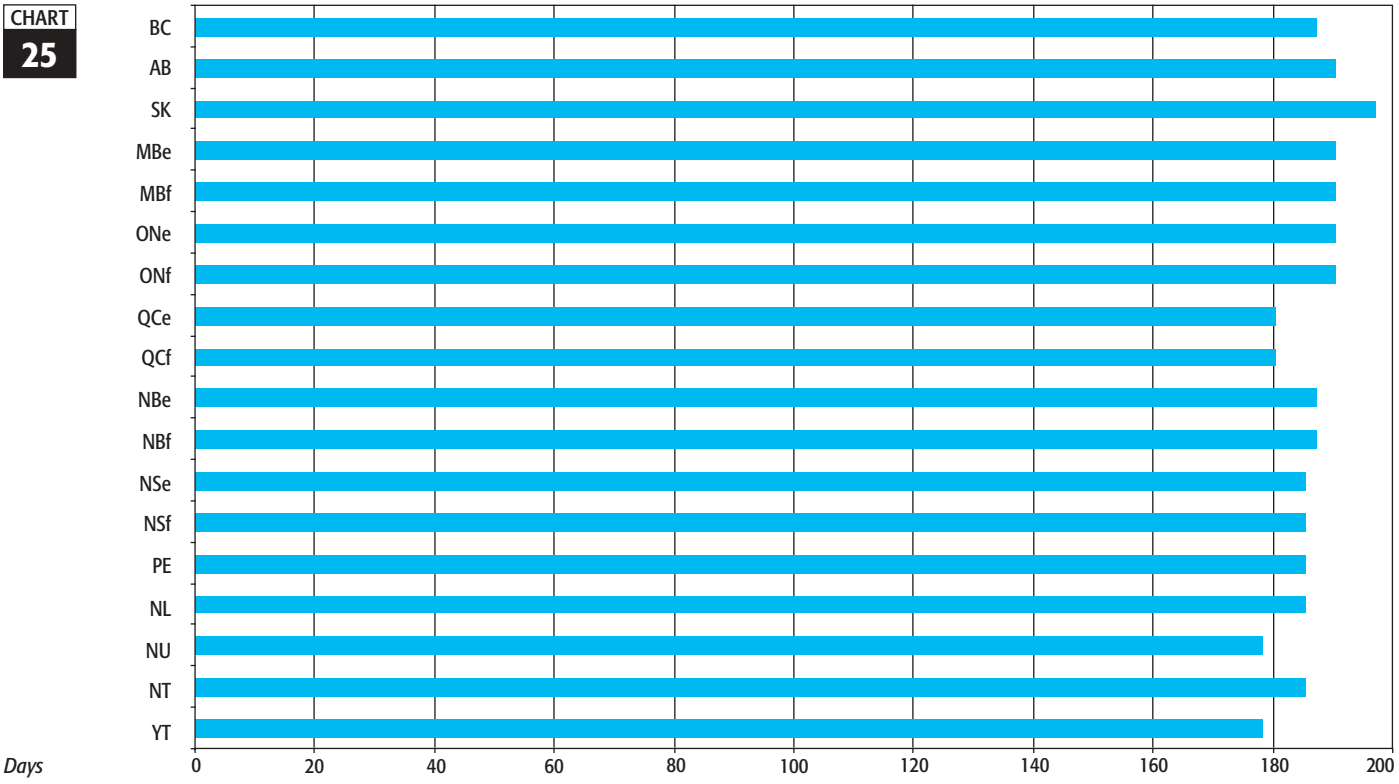
CHART 24



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
More than one	11	7	9	11	18	7	15	13	5	0	9	15	36	47	0	2	20	28	36
One	38	51	58	41	48	51	34	27	29	26	47	48	39	47	31	26	40	36	36

Modal instructional days in school year

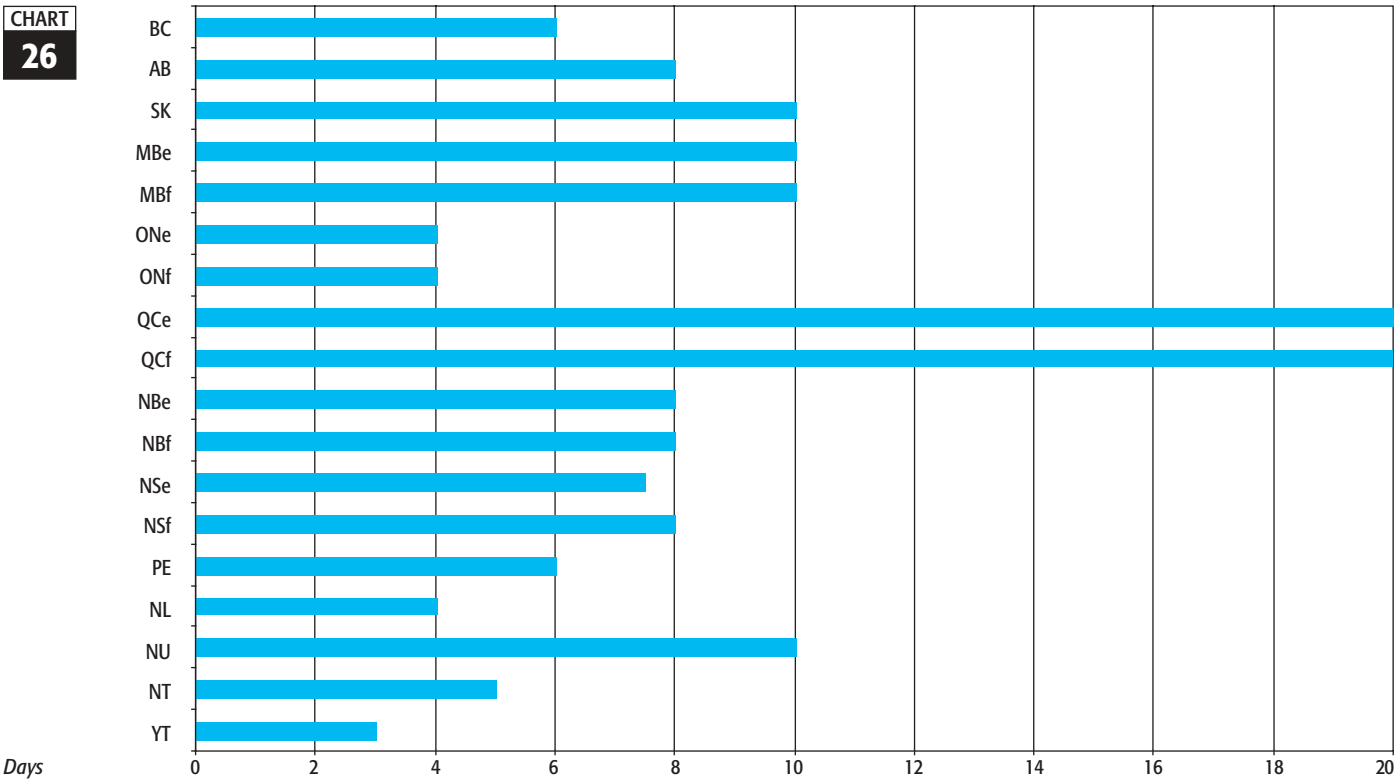
CHART 25



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Days	187	190	197	190	190	190	190	180	180	187	187	185	185	185	185	178	185	178

Modal annual days for professional development and other teacher activities

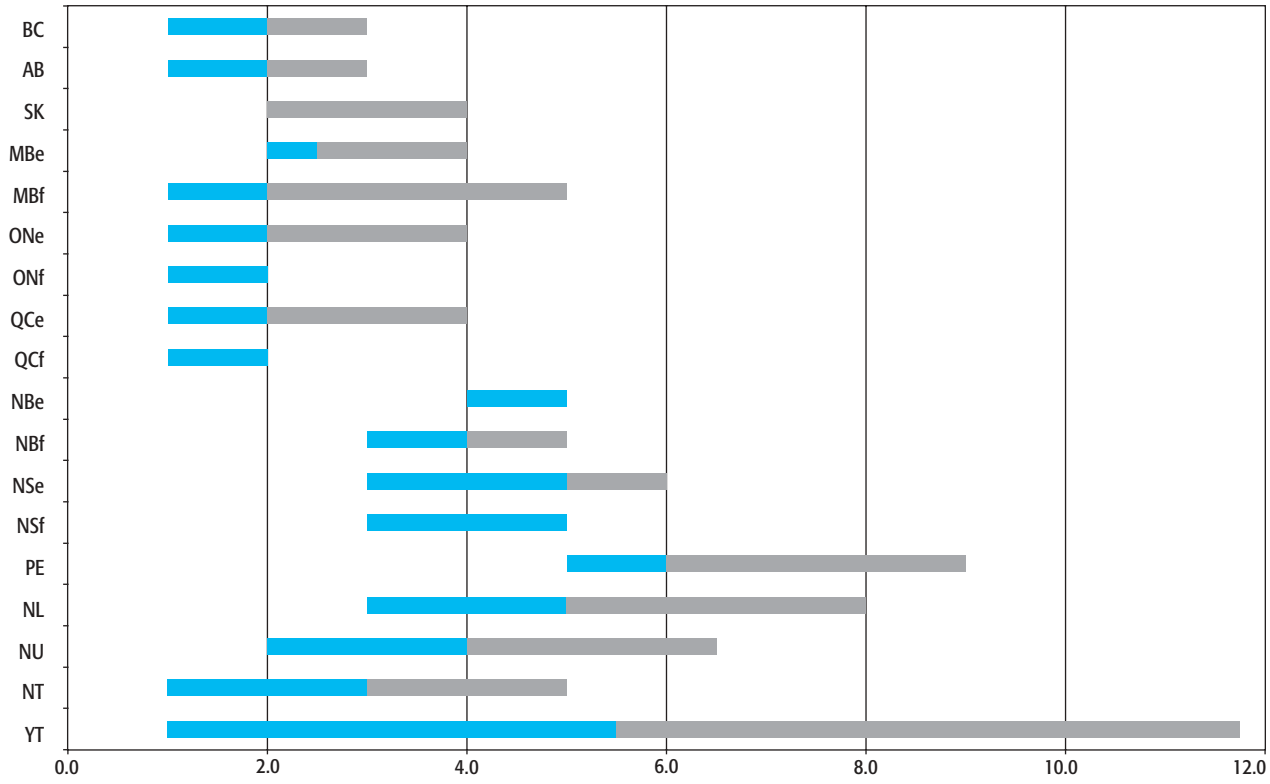
CHART 26



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Days	6	8	10	10	10	4	4	20	20	8	8	8	8	6	4	10	5	3

Median and interquartile range for days school closed

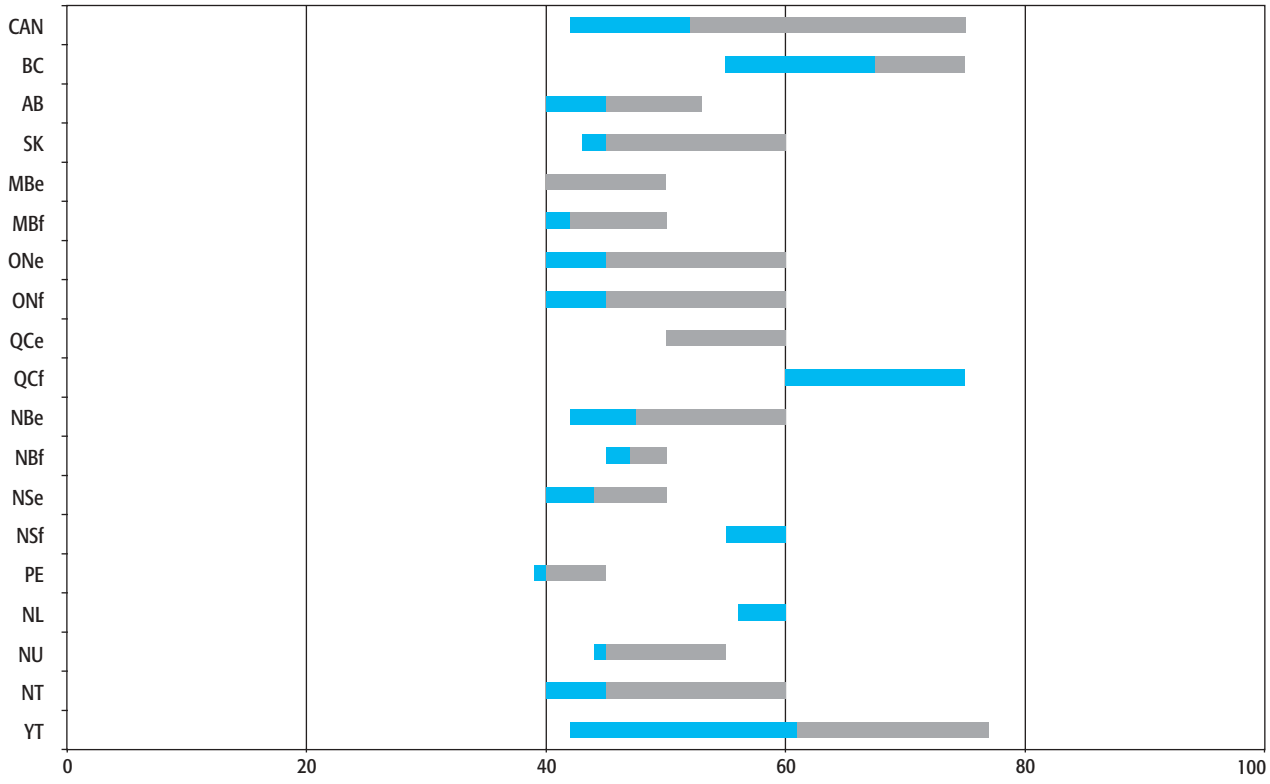
CHART 27



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
50-75 quartile	1.0	1.0	2.0	1.5	3.0	2.0	0.0	2.0	0.0	0.0	1.0	1.0	0.0	3.0	3.0	2.5	2.0	6.3
25-50 quartile	1.0	1.0	0.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	4.5
25 percentile	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	4.0	3.0	3.0	3.0	5.0	3.0	2.0	1.0	1.0

Median and interquartile range for length of class periods: 13-year-olds

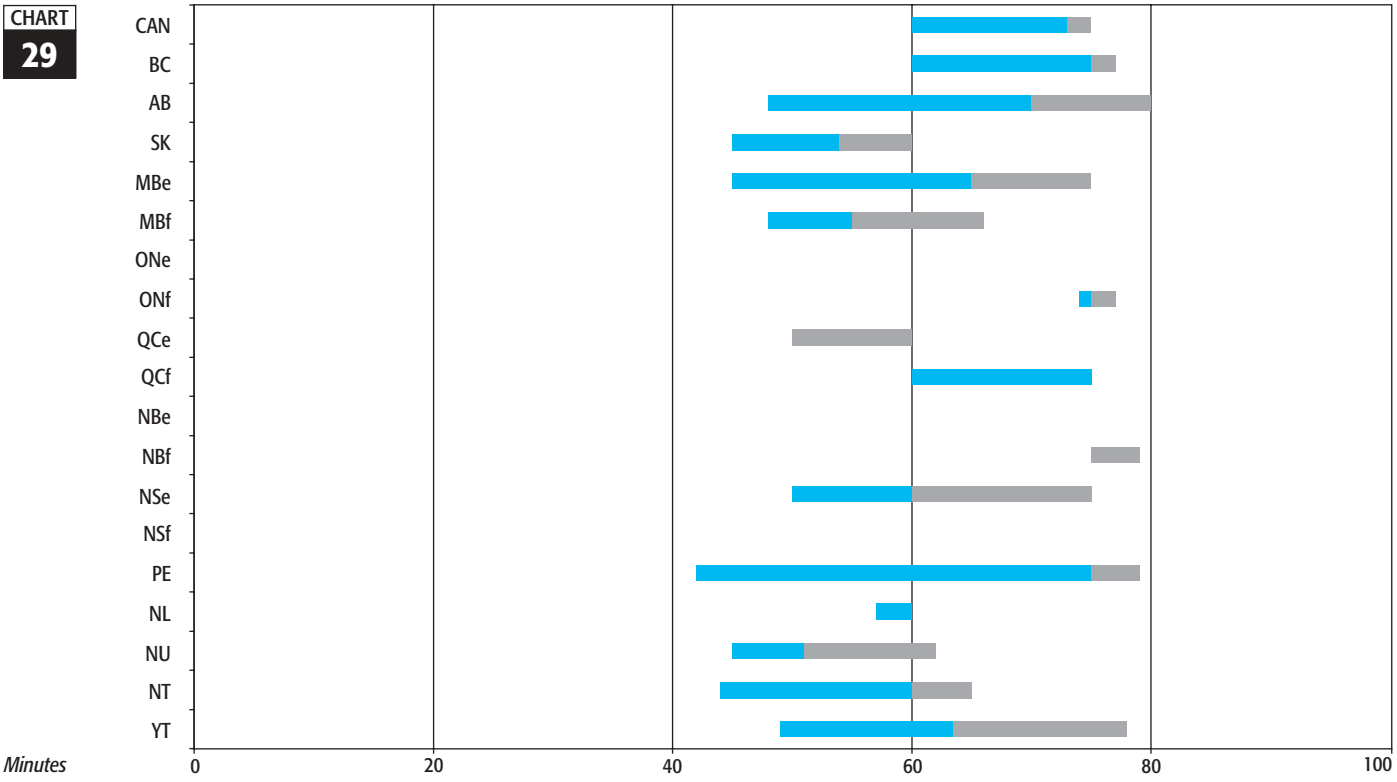
CHART 28



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
50-75 quartile	23	8	8	15	10	8	15	15	10	0	13	3	6	0	5	0	10	15	16
25-50 quartile	10	13	5	2	0	2	5	5	0	15	6	2	4	5	1	4	1	5	19
25 percentile	42	55	40	43	40	40	40	40	50	60	42	45	40	55	39	56	44	40	42

Median and interquartile range for length of class periods: 16-year-olds

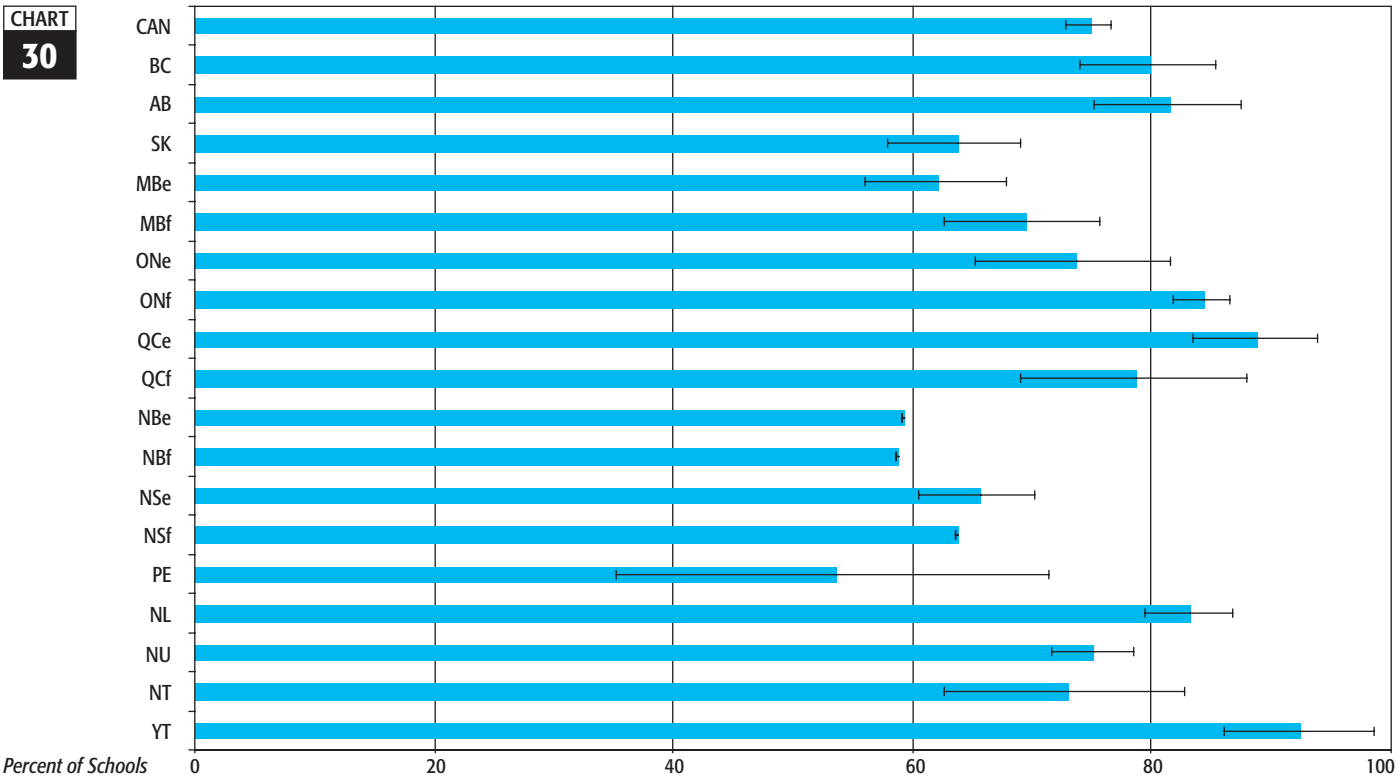
CHART 29



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
50-75 quartile	2	2	10	6	10	11	0	2	10	0	0	4	15	0	4	0	11	5	15
25-50 quartile	13	15	22	9	20	7	0	1	0	15	0	0	10	0	33	3	6	16	15
25 percentile	60	60	48	45	45	48	75	74	50	60	60	75	50	60	42	57	45	44	49

Percentage of schools reporting that previous mathematics achievement has a lot of influence on deciding which mathematics courses 16-year-old students should take

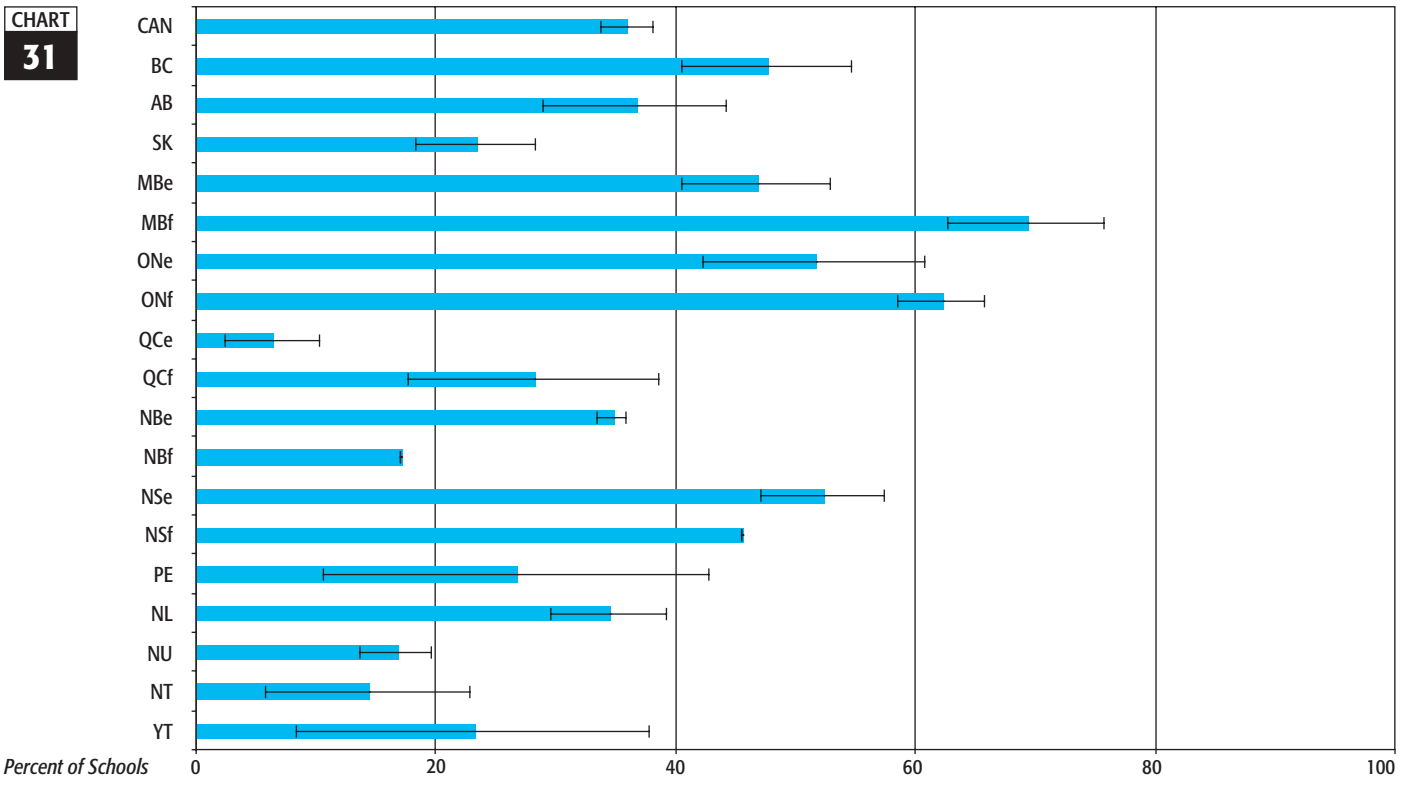
CHART 30



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
A lot	75	80	81	64	62	69	73	84	89	78	59	59	65	64	53	83	75	73	92

Percentage of schools reporting that student wishes have a lot of influence in deciding which mathematics courses 16-year-old students should take

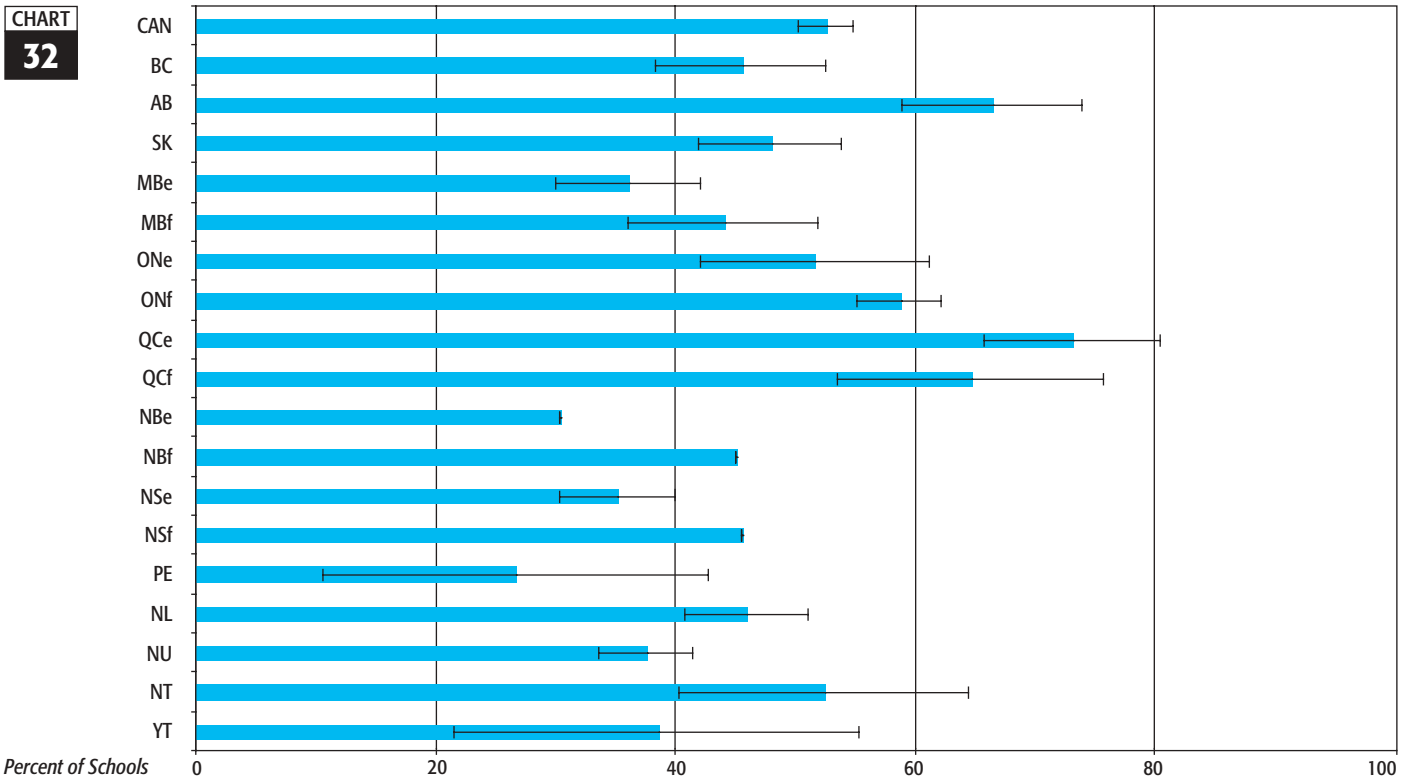
CHART 31



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
A lot	36	48	37	23	47	69	52	62	6	28	35	17	52	45	27	34	17	14	23

Percentage of schools reporting that prerequisites or curricular requirements have a lot of influence in deciding which mathematics courses 16-year-old students should take

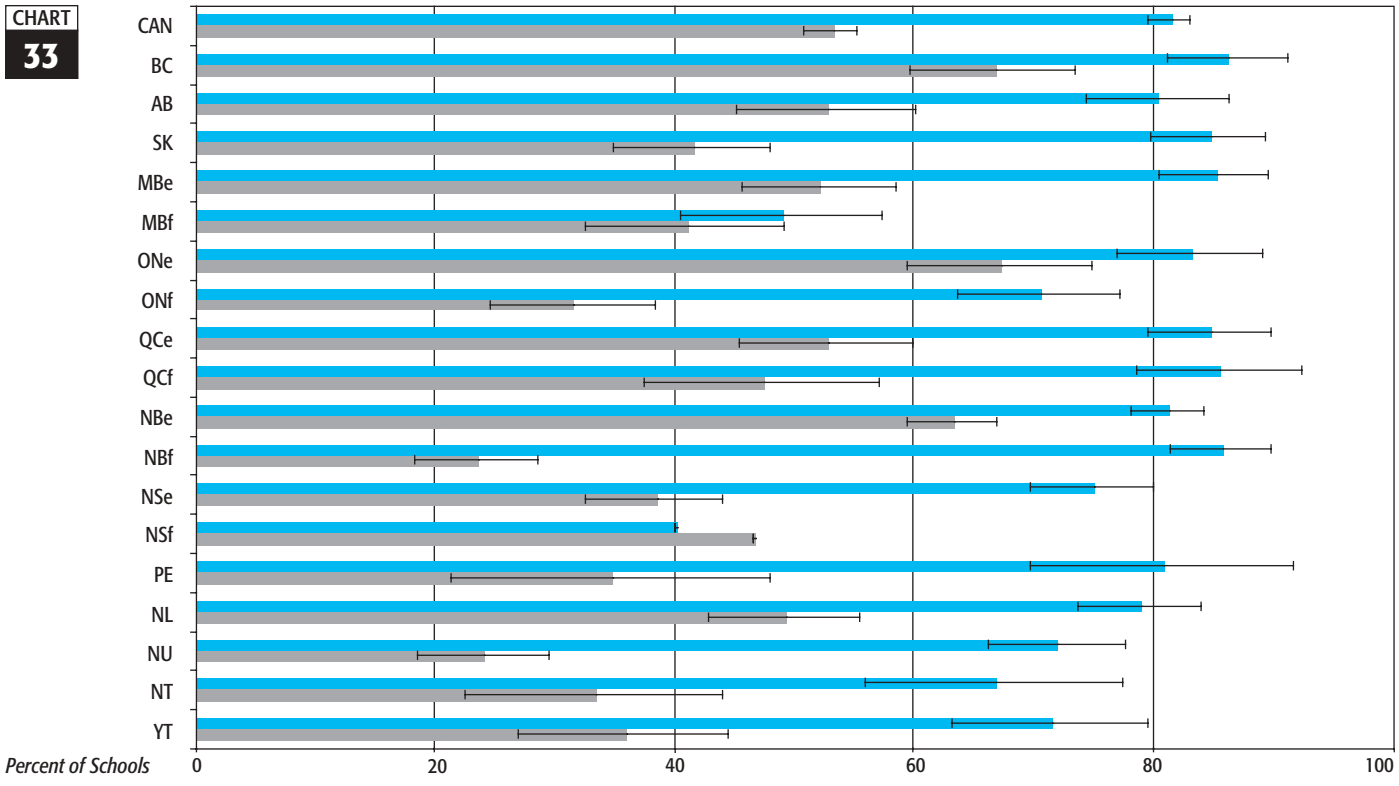
CHART 32



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
A lot	53	45	66	48	36	44	52	59	73	65	30	45	35	45	27	46	38	52	38

Percentage of schools reporting that they provide extra teaching for struggling students and enrichment programs for gifted students

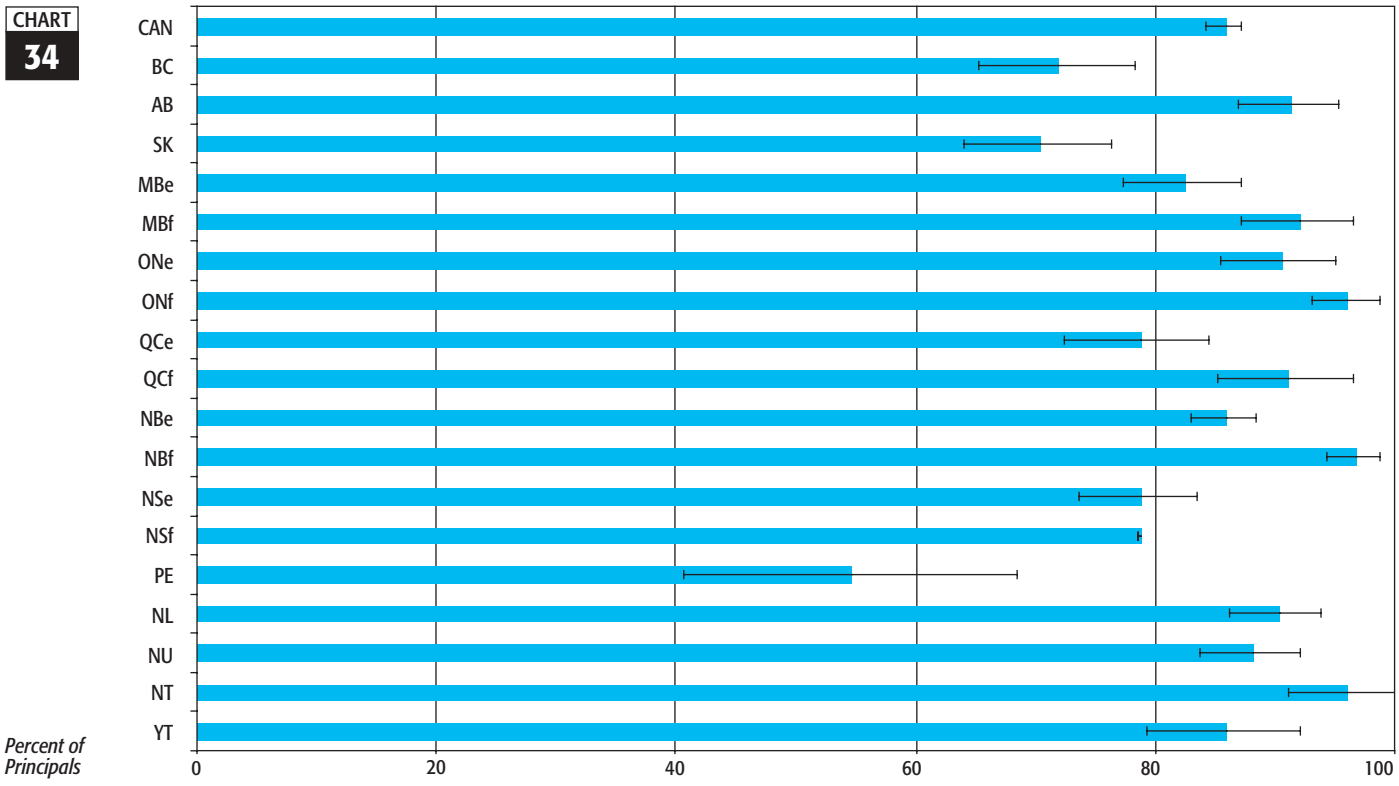
CHART 33



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Extra Teaching	81	86	80	85	85	49	83	70	85	86	81	86	75	40	81	79	72	67	71
Enrichment	52	67	53	41	52	41	67	31	53	47	63	23	38	47	35	49	24	33	36

Percentage of principals agreeing that high school students should be streamed based on abilities

CHART 34



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	86	72	91	70	82	92	90	96	78	91	86	97	79	79	55	90	88	96	86

The teacher questionnaire contained 29 items. Questions were asked about teachers' professional background and experience, teaching assignments and duties, class sizes, interaction with parents and other teachers, lesson planning, classroom activities, resource use, constraints on teaching, homework, and student evaluation. Teachers were also asked to indicate their agreement or disagreement with a number of propositions about the nature of mathematics, factors affecting student learning, and streaming for high school students. Finally an item on "opportunity to learn" was included, in which teachers were asked to indicate whether or not various topics selected from the SAIP mathematics framework were being taught or had been previously taught.

It is important to note that comments are made on differences between jurisdictions. However, in the absence of confidence intervals, these should be interpreted essentially as descriptive of the samples rather than as inferences about the populations. While many of the noted differences are quite large, we cannot estimate the probability that these are due to sampling error. Where regional or language patterns are noted, these are less likely to represent chance effects than individual population comparisons as these effects are effectively replicated over several jurisdictions.

Teacher Background and Experience

Charts 35 to **38** give teacher responses to questions on their background and experience. Generally from 40% to 50% of teachers are female, with the highest percentage of female teachers being in Quebec francophone[5] and the lowest in Nova Scotia francophone schools. In general, teachers tend to be in mid-career. However, median years of experience vary substantially by jurisdiction. Quebec anglophone, Nova Scotia anglophone, and Newfoundland and Labrador teachers tend to have substantially longer experience, while those in Nunavut, the Northwest Territories, and the Yukon tend to have much less experience than others. Since experience is a close proxy for age, the chart suggests that substantial numbers of teachers in the three highest jurisdictions have many teachers approaching retirement age. Indeed, this point is reinforced by the broader distribution of experience. The data show that teachers have tended to spend most of their careers teaching mathematics.

Almost all teachers hold university degrees. The most prevalent degree is the B.Ed. or equivalent, as shown in **Chart 37.** More than 80% of all teachers hold this degree in most populations. Quebec francophone teachers of 13-year-olds are a notable exception to this pattern. A measure of specialization in mathematics is given by the proportion holding degrees in this area, as shown in **Chart 38**. Nationally, this proportion is around 30%, with wide variations being evident across jurisdictions. The percentage holding mathematics degrees is generally higher in francophone than in anglophone populations and higher in Newfoundland and Labrador than in other anglophone jurisdictions. While large numbers of teachers hold more than one undergraduate degree, the proportion with an advanced degree (Master's or equivalent) does not exceed 20% in any jurisdiction. British Columbia, Nova Scotia anglophone, and Newfoundland and Labrador have the highest proportions of teachers with advanced degrees.

Class Size

Teachers were asked to give the average size of the classes they teach, as well as their largest and smallest class sizes. Median average class sizes appear in **Chart 39**. This chart indicates that the overall median class size is around 25, with teachers in a couple of jurisdictions reporting substantially lower class sizes. The data here are reasonably consistent with those reported by principals, although the wording of the question was slightly different. Data on smallest and largest class sizes show even greater variability, with median smallest classes as low as 10 and as high as 26, and median largest classes ranging from the low 20s to the low 30s. Generally, this suggests that class sizes are by no means uniform within schools or within populations.

Time Allocation and Use

Chart 40 shows the median number of hours per week of teacher-scheduled class time and time assigned to mathematics teaching. Teachers in most jurisdictions have a median of just over 20 hours scheduled time. The difference between total time and time assigned to mathematics is a measure of the degree to which teachers are assigned as mathematics specialists. The degree of specialization is much more variable than overall time assignments. Teachers in Quebec tend to have relatively more highly specialized assignments than others. The school data show that specialization is related to the age of the students. However, breakdown is not available in the teacher data.

Teachers were asked about time spent on a variety of activities outside of scheduled school hours. These times were added to

[5] This assessment was not administered to 16-year-olds in Quebec. This can therefore be expected to have some impact on teacher responses.

scheduled class hours to give an estimate of total weekly work hours. Median total hours reported are given in **Chart 41**. Teachers in most jurisdictions reported medians of just over 50 hours per week, with relatively small variations across jurisdictions. Among the specific categories, planning and preparation and marking were reported as taking the most time, with medians in the 4–5 hour range in all jurisdictions.

In most schools, some time is allocated for planning and preparation during the regular school day. Median scheduled times for these activities are given in **Chart 42**. These medians ranged from 3 to 5 hours across most jurisdictions, with Quebec anglophone teachers standing out as having more hours than any others.

Teachers were asked about the amount of scheduled time lost because of class cancellations, school closures, and the like, as well as about time lost during class periods through disruptions of various kinds. Responses to the first question were very similar to those given by principals **(Chart 27)**, and thus will not be repeated here. Time lost during class periods is shown in **Chart 43.** Distinct jurisdictional differences are apparent here, with francophone teachers and those in the territories reporting more time lost due to disruptions.

Contact with Parents

Chart 44 shows for each jurisdiction the percentage of teachers reporting that they meet with parents once a month or more to discuss individual students. There are distinct language differences here, with teachers in anglophone schools reporting much more frequent parent contact than their francophone counterparts. Looking at the same issue in a different way, teachers were asked to estimate the proportion of parents with whom they had contact over the school year, both in parent-teacher interviews and on other occasions. The median percentages are reported in **Chart 45.** It is clear from this chart that teacher contact with parents occurs primarily through interviews, and that there is relatively little contact of other forms. Total contact varies widely by jurisdiction, with no clear pattern.

Taking the results of **Charts 44** and **45** together suggests that teachers may have fairly frequent contact with a relatively small proportion of parents and no contact, other than through interviews, with a large majority of parents. It would be interesting to pursue this point in more detail and especially to determine the nature of this contact and whether it tends to be teacher- or parent-initiated.

Lesson Planning

The extent of collaboration among teachers was examined by asking how often respondents meet with other teachers for planning purposes. The percentage reporting that they meet once a month or more is shown in **Chart 46**. The figures show fairly substantial variation across jurisdictions. Other than in Quebec, there was a slight tendency for francophone teachers to report less collaboration than anglophone teachers within the same province.

Teachers were asked how often they used a selection of resources in their lesson planning, including their own previously prepared lessons, materials prepared by other teachers, textbooks, other resource books, curriculum documents, and Internet or other computer-based materials. The results are complex to present in chart form but may be highlighted as follows:

1. There is substantial variability across materials but greater commonality across jurisdictions, suggesting that teachers plan in much the same way, wherever located.
2. The most commonly used resources are clearly the teacher's own previously prepared lessons and student textbooks.
3. Teacher's guides or teacher's editions of textbooks are used quite frequently in planning, with teachers in the Western provinces and Ontario reporting lower levels of use of these resources than those in other jurisdictions.
4. Provincial curriculum guides are used regularly by fewer than half the teachers generally, with strong jurisdictional differences. Quebec teachers, both anglophone and francophone, reported very low levels of use of these resources. Relatively low usage was also reported by teachers in the territories and British Columbia. Manitoba and New Brunswick teachers reported the highest levels of use.
5. Other text or resource materials are used relatively rarely.
6. Internet and other computer-based materials are not in common use, with about 10% of teachers overall reporting frequent use and no jurisdiction having more than 20% of teachers with frequent use (a few times a week or more). Media-generated materials were reported as used even less often, with an average of about 10% of teachers reporting frequent use.

Classroom Activities

Teachers were given a fairly lengthy list of activities and resources that might be used in their classrooms and asked to report the frequency of use. Because of the large number of items, the results will be presented only in summary form. However, this should be sufficient to reveal distinct jurisdictional and language differences in teaching activities.

1. Teaching problem-solving strategies; working with individual students; diagnosing and correcting individual problems and weaknesses; giving feedback on assignments, tests and quizzes; working on assigned exercises from the textbook; and using workbooks and worksheets were the most frequently reported classroom activities. There was a tendency for francophone teachers to report working with individual students less often than anglophone teachers, although the frequency of this activity was high for all groups.

2. While less frequent overall than the above activities, there were substantial language differences in the reported use of reading from or summarizing textbooks, student study of textbooks, and outlining the outcomes to be achieved in mathematics, with francophone teachers reporting these activities more frequently than anglophone teachers. These differences were especially pronounced for outlining outcomes, suggesting that francophone teachers are more clearly focused on outcomes than anglophone teachers.
3. Jurisdictional and language differences were also found in the frequency with which teachers reported discussion of things other than the topic of the lesson. This activity was less prevalent in francophone than in anglophone classes and generally less in Quebec and Newfoundland and Labrador than in other jurisdictions. Off-topic discussions were more prevalent in the Northwest Territories and Nunavut than elsewhere.

Learning Resources

By far the most widely used learning resources were mathematics books and magazines and measuring instruments such as metre sticks, protractors, and compasses. Among audio-visual resources, overhead projectors were most commonly used, with percentage of frequent use (a few times a month or more) in the 60–80% range in most jurisdictions. Other audio-visual resources, such as slides, films, or videos were used by only about 10% of teachers overall, with the lowest levels of use being in Quebec. Beyond this, use of specific resources was less frequent and highly variable. Nevertheless, it is worth noting that it was rare for teachers to report that any particular resource was unavailable.

Among resources that might be considered unique to mathematics teaching are graphing calculators and specific types of manipulative materials such as geo-boards, algebra tiles, or fraction kits. **Charts 47** and **48** give the results for these two types of resources. About half the teachers overall reported using manipulative materials a few times a month or more. Teachers in Ontario, Quebec, and British Columbia reported the lowest use of such materials. Relatively high levels were reported by teachers in Nova Scotia and Prince Edward Island, along with Manitoba French. There was a substantial difference between anglophone and francophone New Brunswick teachers, with francophone teachers reporting lower use. Use of graphing calculators was less frequent and more variable, with the lowest use being in Quebec and high use occurring in British Columbia, Alberta, Ontario, and Newfoundland and Labrador.

Because substantial emphasis has been placed on new information and communications technologies in schools, several items were included on teacher use of resources in this area. Responses to these items are reported in some detail because of the strong policy interest in this area and because of the substantial variability found in teacher responses.

Chart 49 gives the percentage of teachers reporting use of computers in mathematics classes a few times a month or more. These percentages are highly variable, with the highest use in Alberta and Manitoba English and the lowest in Quebec (both languages). Software use follows essentially the same pattern, as shown in **Chart 50**. Both instructional software (designed specifically for teaching and learning) and standard software (word processing programs, spreadsheets, and the like) show very similar patterns of use. Jurisdictions having higher computer use tend also to have higher use of both types of software.

Use of the Internet in mathematics instruction is relatively low and highly variable, as shown in **Chart 51.** The highest levels of use are found in Manitoba anglophone and Nova Scotia francophone, while the lowest are in Quebec, British Columbia, and Newfoundland and Labrador. **Chart 52** gives a fairly similar picture for computer lab use. Alberta and Manitoba English teachers reported the most use, while teachers in British Columbia, Saskatchewan, Quebec, New Brunswick English, and Newfoundland and Labrador all reported relatively low usage.

Questioning

Questioning may be seen as one of the most common of teaching activities. A series of items on the questionnaire was designed to shed light on patterns of questioning. Substantial differences were found in the extent that various questioning and response techniques were used. These patterns were relatively consistent across jurisdictions, indicating that mathematics classrooms across the country are similar in this respect.

The most common form of teacher questioning throughout is asking questions of the class as a whole, with close to 90% of teachers reporting that this is done several times a class or more. Asking questions of individual students by name is slightly less common, in the 75% range. Here there is some evidence of language differences, as the four lowest levels of use were found among francophone teachers (the exception here is Nova Scotia).

When asked more specifically if particular students are targeted for questioning, about 40% of teachers reported asking questions of students not paying attention a few times a class or more, about 30% used questioning of reticent students to help improve their participation, and less than 20% reported targeting the best students to make it more likely to get a good answer. Jurisdictional differences in these techniques were relatively small, with no obvious patterns.

Teachers used questions requiring brief student responses more often than those requiring elaborated responses (63% versus 46% several times a class or more). Questions designed to stimulate general discussion were frequently used by only about 20% of teachers. There was a clear pattern of francophone

teachers, Quebec being the exception, making less use of brief response questions. However, there was no complementary tendency for these teachers to use elaborated response questions.

The most common form of student question was reported by teachers as that requiring a brief teacher response. A distinct language pattern was apparent here, with francophone teachers reporting this type of student question less frequently than anglophone teachers. Student questions requiring elaborated teacher response were also reported relatively frequently (about 50% of teachers reporting that this occurs several times a class or more). However, there was no apparent language pattern for this type of question. Student questions requiring response by other students were relatively rare (less than 20% of teachers reporting frequent occurrence).

Challenges to Mathematics Teaching

The questions asked of teachers in this area were similar to, but more specific to mathematics teaching than, those asked of principals.

Chart 53 gives the percentage of teachers reporting that the range of student abilities is a major challenge to their ability to teach. The chart clearly indicates that most teachers see this range as a problem. Range of student home backgrounds is perceived by teachers as much less of a problem than range of abilities, as **Chart 54** indicates. In this case, francophone teachers throughout see this as less of a problem than anglophone teachers. Teachers in the territories perceive this as more of a challenge than those elsewhere.

On the more specific question of students with special needs, as shown in **Chart 55**, this was seen as a major challenge by about 35% of teachers overall.

Chart 56 indicates that the pattern for disruptive students as a challenge is quite similar to that for special-needs students. Teachers in francophone schools and those in the territories appear to perceive disruptive students to be more of a challenge than others. While this raises the question of whether these two are connected, a connection cannot be inferred from the data at hand.

Results for large class size as a challenge to teaching are presented in **Chart 57**. In general, fewer teachers perceive large class size as a greater problem than other student factors already given. However, there are fairly wide jurisdictional differences in this area, with the three highest levels of challenge being reported by francophone teachers.

School morale is not widely seen as a concern, but **Chart 58** indicates that substantial jurisdictional differences exist in this area. The highest levels of concern here are among francophone teachers, with the language differences in Quebec, New Brunswick, and Nova Scotia being particularly pronounced.

Several other items in this series may be summarized briefly. Relatively few teachers perceive shortage of materials or equipment, including computers, or inadequacies in resource materials, curriculum design, or physical facilities as presenting major challenges. This is also true for concerns with personal safety or safety of students, pressure from parents, external examinations, or lack of in-service preparation for new curriculum. Generally, therefore, it seems reasonable to conclude that student factors present much greater challenges to teachers than school or program factors.

Homework

Chart 59 gives the percentage of teachers assigning homework more than 3 times per week and expecting 30 minutes or more of work in doing this homework. A large majority of teachers in most jurisdictions do assign frequent homework although there are jurisdictional variations here, with Nova Scotia French and Nunavut teachers being much lower than others. The proportion of teachers expecting more than 30 minutes work is much smaller and more variable. No correlation was found between frequency and amount, suggesting that teachers do not generally compensate for more frequent homework by expecting less time per homework assignment.

The most common type of homework activity is working on problems or questions from the textbook. Using worksheets or workbooks is also common. Working on long-term projects, preparing oral reports, and keeping a journal were rarely used. Language variations were apparent in one specific area, that of writing definitions or other short writing assignments, where francophone teachers used this type of homework more often than anglophone teachers.

Almost all teachers reported that they record a few times a week or more whether students have completed their homework, with a slight tendency for francophone teachers to record more often than anglophone teachers. **Charts 60 and 61** give some specifics on how teachers deal with homework once it is submitted. Fewer than half the teachers overall correct and return homework assignments a few times a week or more. These proportions are lowest in the four francophone populations and in Prince Edward Island and Newfoundland and Labrador and are highest in the three territories. Feedback on homework is much more frequently given to the whole class. This procedure is used more often by francophone than by anglophone teachers.

The proportion of teachers frequently using homework to contribute toward grades or marks varies quite widely, as **Chart 62** indicates. Such usage is relatively low in Ontario, Quebec, New

Brunswick and Newfoundland and Labrador, with language differences in Quebec and New Brunswick.

Student Assessment

Teachers use a wide variety of different forms of work in assessing students, including tests, homework, and other formal assignments, as well as informal techniques such as observation and student participation. Some interesting jurisdictional differences emerged in response to a series of questions on assessment.

First, **Chart 63** shows weights given by teachers to two different forms of teacher-made tests, namely multiple-choice and other objectively scored tests and short answer/essay tests. While more weight is given to short-answer/essay than to objectively scored tests in most jurisdictions, there seems to be a trade-off between these types. Relatively equal weight is given to the two types in Alberta, the Northwest Territories, and the Yukon. Francophone teachers give decidedly more weight to short-answer/essay tests and relatively little weight to objectively scored tests compared to anglophone teachers in the same jurisdictions.

Differences between the two language groups are even more evident on student participation measures such as class attendance, participation in class activities, effort, and improvement. These differences are illustrated in **Charts 64** and **65** for class attendance and improvement over the year. Much more weight is given in these areas by francophone teachers (and by Nunavut teachers) than anglophone teachers. This pattern is repeated for all items related to participation.

Almost all teachers reported using ten or more different scores or marks in computing student final grades. The notable exceptions are Ontario francophone and Quebec teachers in both languages who tend to use many fewer indicators.

Views on the Nature of Mathematics and Student Mathematics Learning

A four-point scale (strongly disagree, disagree, agree, strongly agree) was used to examine teacher opinions on a number of propositions about the nature of mathematics and the role of home background, talent, ability, and work in student learning.

There was almost universal agreement among teachers that mathematics is primarily a process of solving problems and also that it is primarily a deductive system. A majority of teachers disagreed with the proposition that mathematics is primarily a computational system. Teachers in Saskatchewan were most likely and Quebec francophone teachers least likely to support this proposition. There were also language differences in agreement with the proposition that mathematics is primarily a precise way of describing the real world. Although a majority of teachers supported this proposition throughout, more francophone than anglophone teachers showed agreement.

The use of calculators in mathematics teaching is a perennial source of controversy, with some arguing that students should first master basic skills and others taking the position that routine computations are not the essential feature of mathematics and that calculators can give relief from the burden of such computations, leaving time for more important things. The weight of teacher opinion is clearly on the first side of this argument, as illustrated by **Chart 66**. Teacher opinion is more variable on the "earliest grades" side of the argument, with Quebec francophone teachers showing least support and Nunavut teachers most support for this proposition.

Chart 67 shows that a majority of teachers agree with the proposition that what teachers can accomplish is limited by the influence of student ability. Once more, language differences are apparent, with francophone teachers generally showing less support for this proposition.

As **Chart 68** indicates, only small proportions of teachers support the proposition that students need natural talent to do well in mathematics courses, while there is much greater agreement on the need for hard work. Interestingly, the language differences here show less agreement with both propositions on the part of francophone teachers.

The final question in this series was concerned with streaming. **Chart 69** shows close to 90% support in most jurisdictions for the proposition that students should be streamed into different programs based on their abilities. Jurisdictional differences were relatively small. However, Saskatchewan teachers and Quebec francophone teachers showed slightly lower levels of agreement than others on this issue.

Opportunity to Learn

One of the main issues in trying to make sense of achievement data is whether students have had an opportunity to learn the material included on the assessments. Although the concept of opportunity to learn (OTL) has been less explicit in the SAIP frameworks than in some other studies, it is nevertheless important, especially in interpreting interjurisdictional differences, as it is possible that curriculum differences may result in differences in opportunity to learn the specific concepts tested. Even under the same curriculum, teachers may choose to emphasize different areas of learning, thus giving another source of differences in opportunity to learn.

Devising a way to measure OTL has presented challenges in the design of many assessment programs. The particular approach

taken here was to ask teachers about their expectations for teaching a variety of topics derived from the SAIP framework and hence included in the SAIP assessments. This was originally attempted in the 1999 Science Assessment, but the item was cumbersome and difficult for both teachers and analysts to interpret. A somewhat streamlined version of this approach was attempted for the current assessment. A random sample of 45 statements of expected outcomes was selected from the total set of more than 200 outcomes contained within the SAIP mathematics framework. Teachers were asked to indicate whether they expected the outcome to have been taught in previous years, whether it was taught this year, or whether it was not taught until later grades.

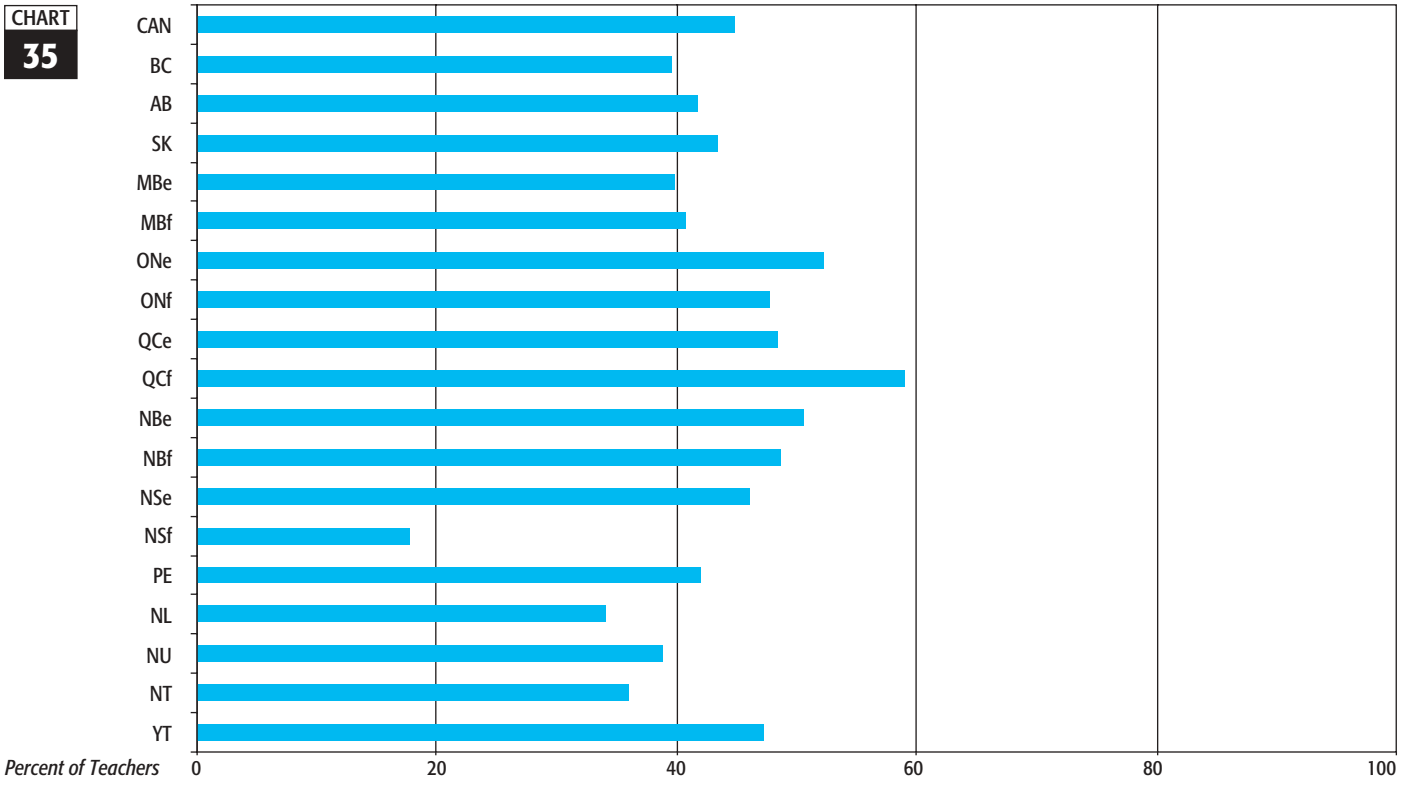
Results for 13- and 16-year-olds are given in **Charts 70** and **71**. **Chart 70** indicates, first, that teachers of 13-year-olds taught more topics in the current year than they expected students to have been taught previously. This suggests the possibility that the SAIP assessment is fairly closely aligned with the curriculum to which 13-year-olds are exposed. This point requires further analysis because curriculum is generally thought of as grade-oriented rather than age-oriented.

Chart 71 indicates a clear progression from 13-year-olds to 16-year-olds as teachers at the latter level expect more topics to have been taught previously and expect to teach fewer this year. This, of course, is the expected progression and fits the general expectation (and result) that 16-year-olds will perform better than 13-year-olds on the SAIP assessments. Jurisdictional differences are difficult to discern here because of the combination of previous and current learning. There does seem to be some tendency at age 16 for lower previous expectations and higher current teaching to go together, suggesting that teachers may attempt to compensate for gaps in previous learning. However, the pattern is not distinct enough to permit a clear statement on this point.

A rough indicator of total opportunity to learn is the sum of previous expectations and this year's teaching. (The indicator is rough partly because an argument can be made that the current year's learning is of greater value for test performance than past learning.) These figures are given in **Chart 72**. Interestingly, once previous and current teaching are combined, the differences between 13-year-old and 16-year-old learning is not as great as might be expected. This would not be surprising if the SAIP framework is geared mainly to what has been learned by age 13. It is possible, for example, that 16-year-olds have been exposed to mathematics topics that are not included in the framework. This point is perhaps best investigated further by curriculum analysis, as has been done in some similar assessments.

Percentage of female teachers

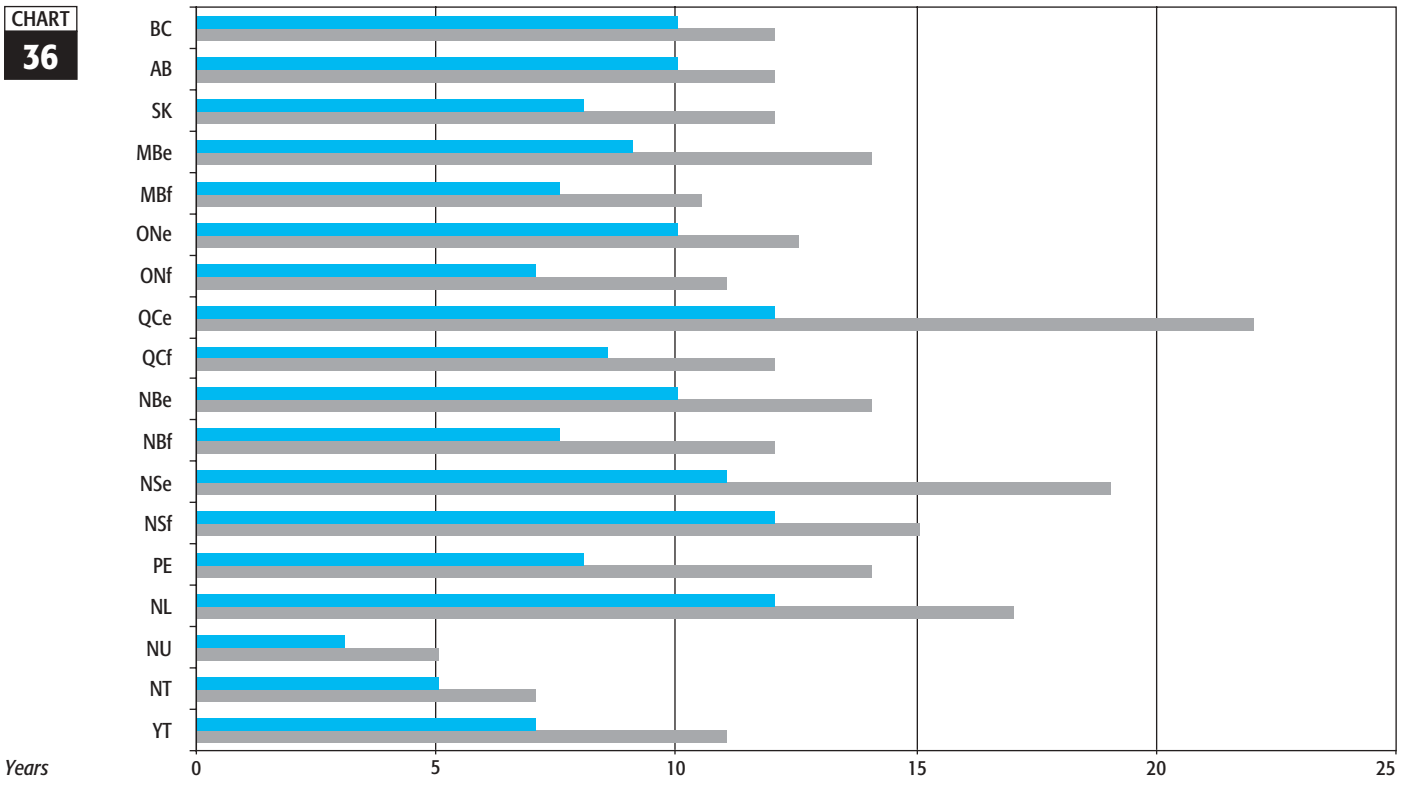
CHART 35



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
% Female	45	39	42	43	40	41	52	48	48	59	50	48	46	17	42	34	39	36	47

Median total years of experience and years of experience teaching mathematics

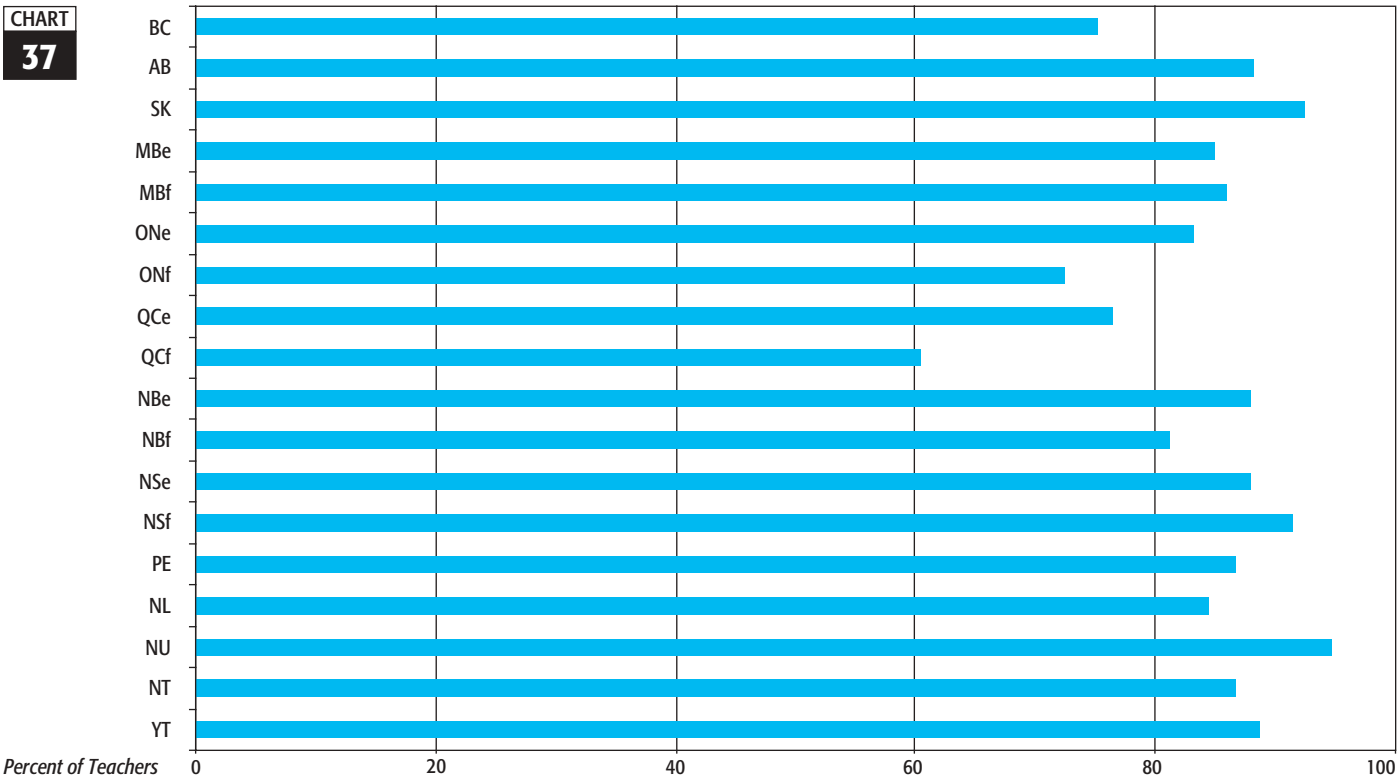
CHART 36



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Mathematics	10	10	8	9	7.5	10	7	12	8.5	10	7.5	11	12	8	12	3	5	7
Total	12	12	12	14	10.5	12.5	11	22	12	14	12	19	15	14	17	5	7	11

Percentage of teachers with B.Ed. degree or equivalent

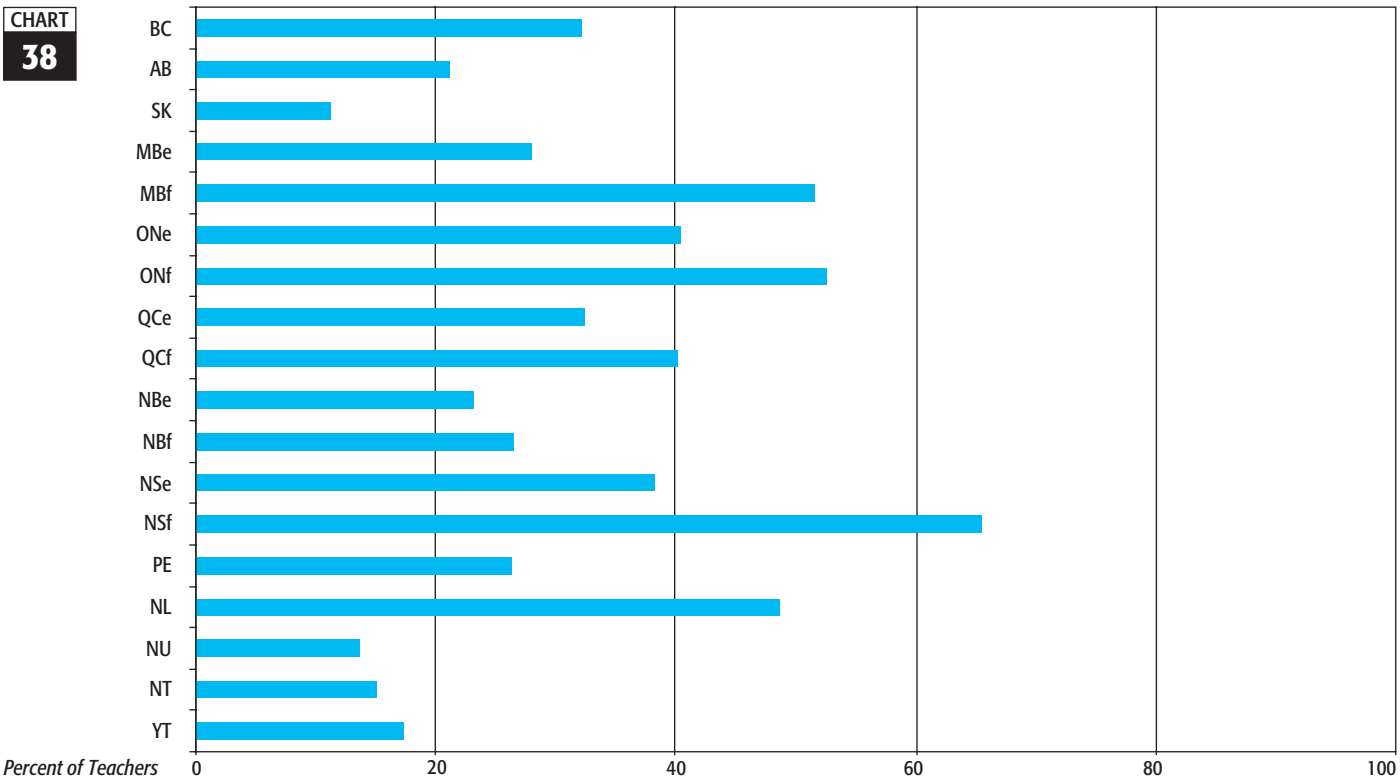
CHART 37



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	75	88	92	85	86	83	72	76	60	88	81	88	91	86	84	94	86	89

Percentage of teachers with degree in mathematics

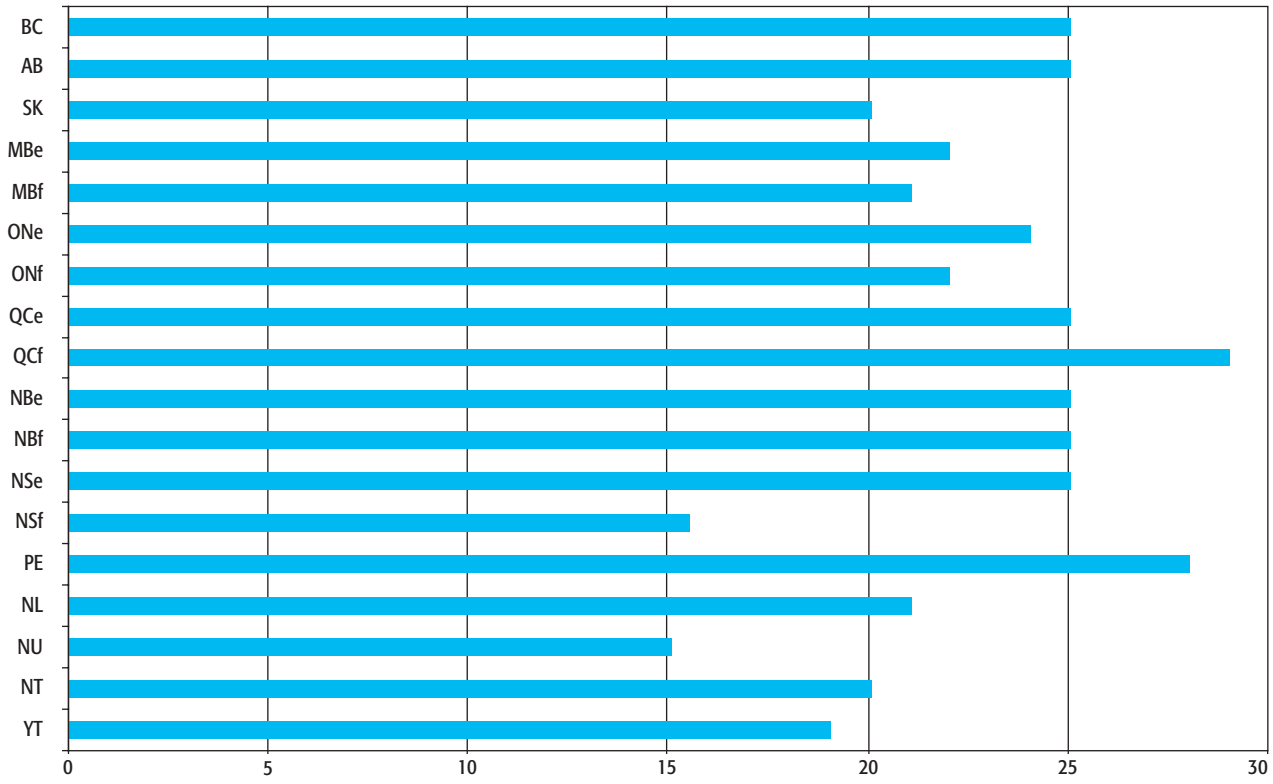
CHART 38



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	32	21	11	28	51	40	52	32	40	23	26	38	65	26	48	13	15	17

Median average mathematics class size

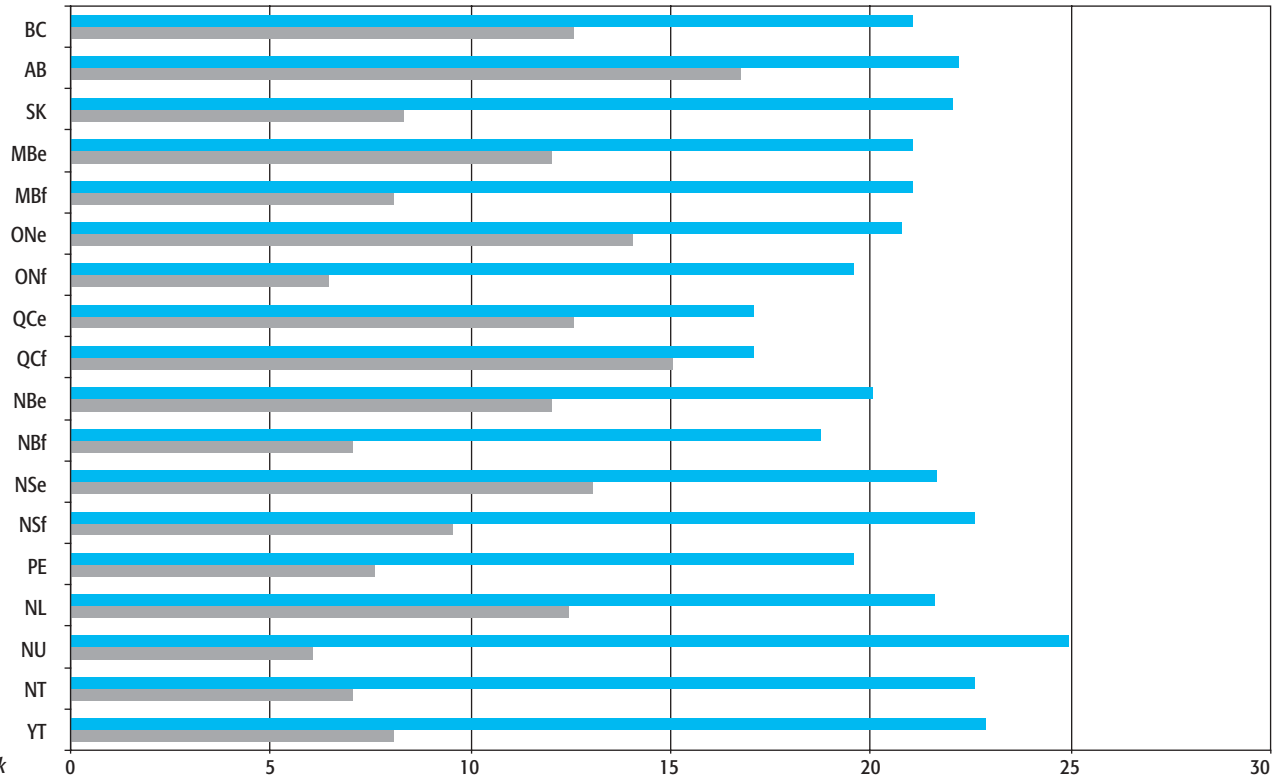
CHART 39



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Students	25	25	20	22	21	24	22	25	29	25	25	25	16	28	21	15	20	19

Median hours per week total teaching and mathematics teaching

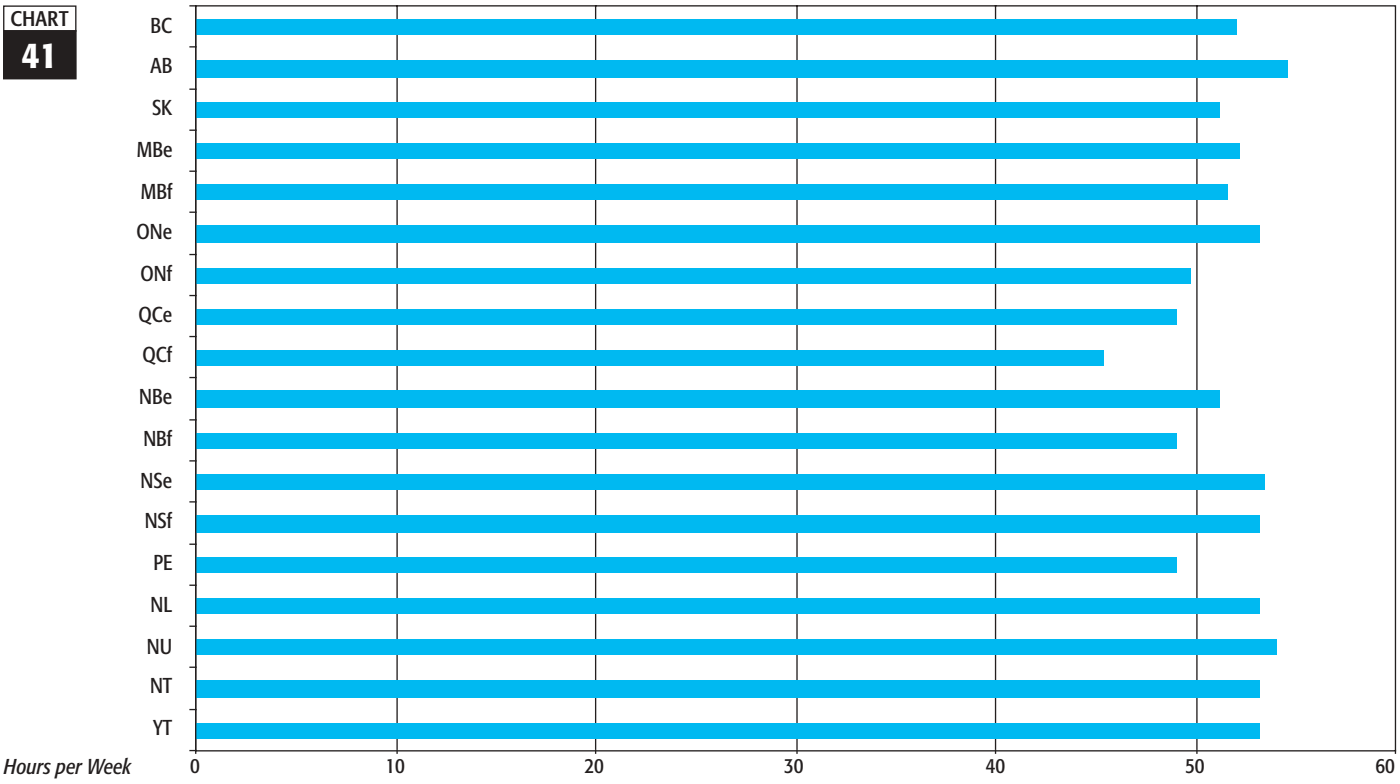
CHART 40



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Total	21	22	22	21	21	21	20	17	17	20	19	22	23	20	22	25	23	23
Mathematics	13	17	8	12	8	14	6	13	15	12	7	13	10	8	12	6	7	8

Median total teacher work hours per week

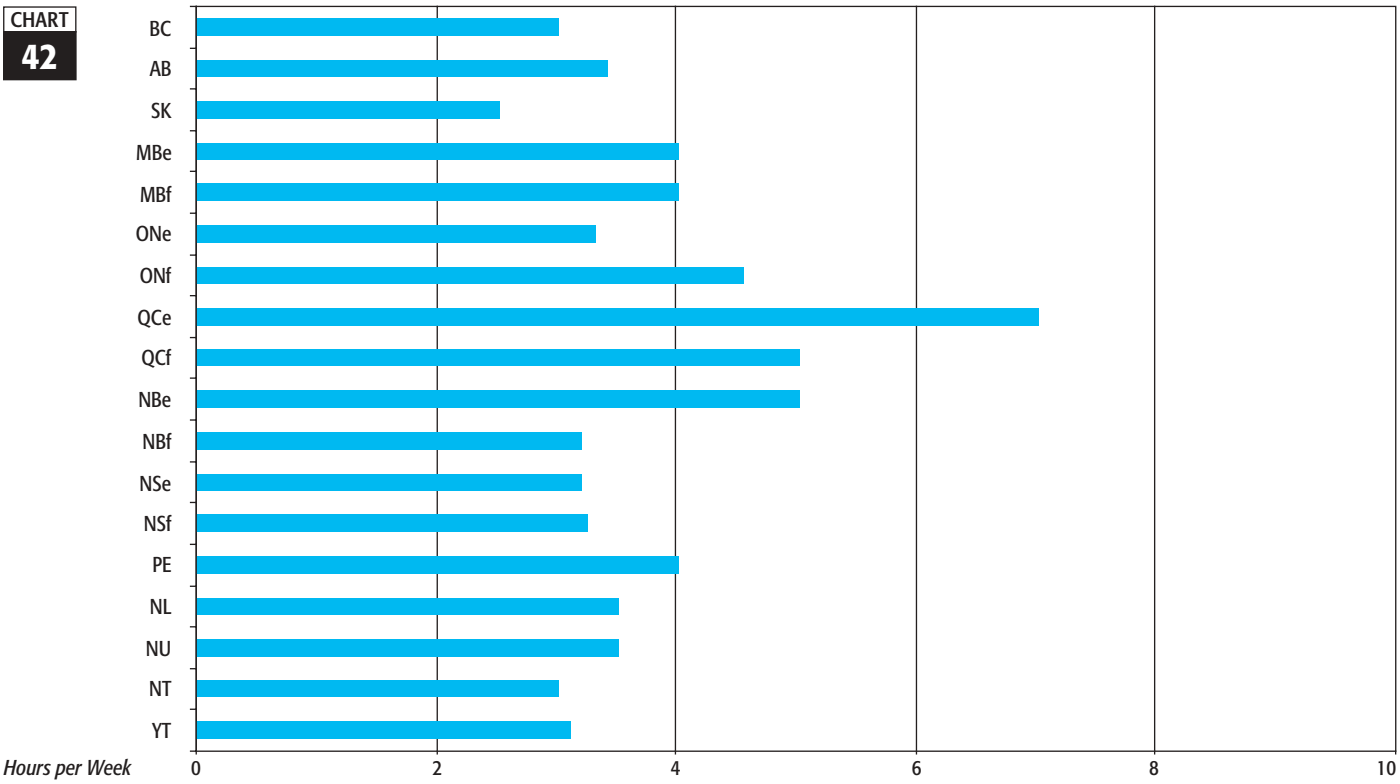
CHART 41



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Hours	52	54	51	52	52	53	50	49	45	51	49	53	53	49	53	54	53	53

Median scheduled preparation hours per week

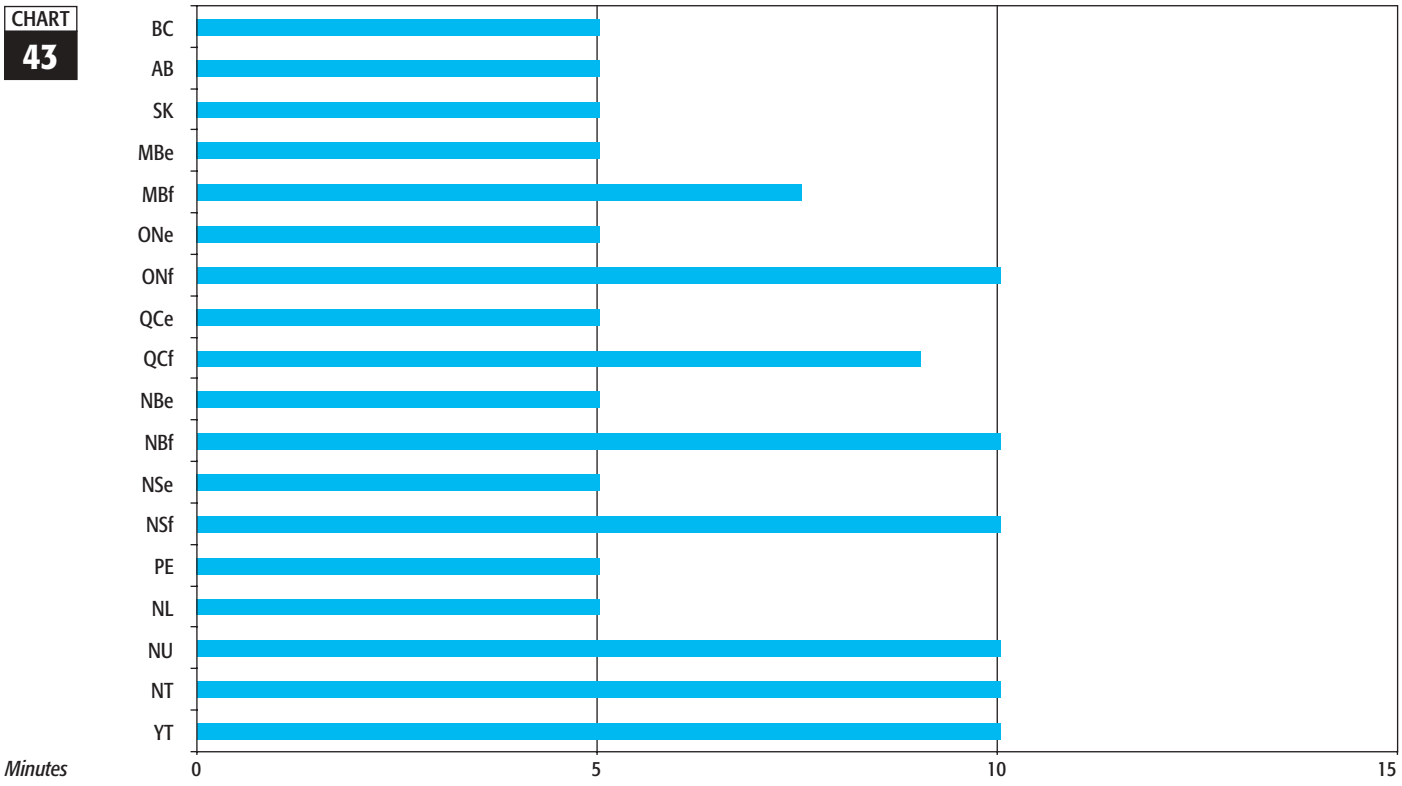
CHART 42



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Hours	3.0	3.4	2.5	4.0	4.0	3.3	4.6	7.0	5.0	5.0	3.2	3.2	3.3	4.0	3.5	3.5	3.0	3.1

Median number of minutes lost to disruptions per class period

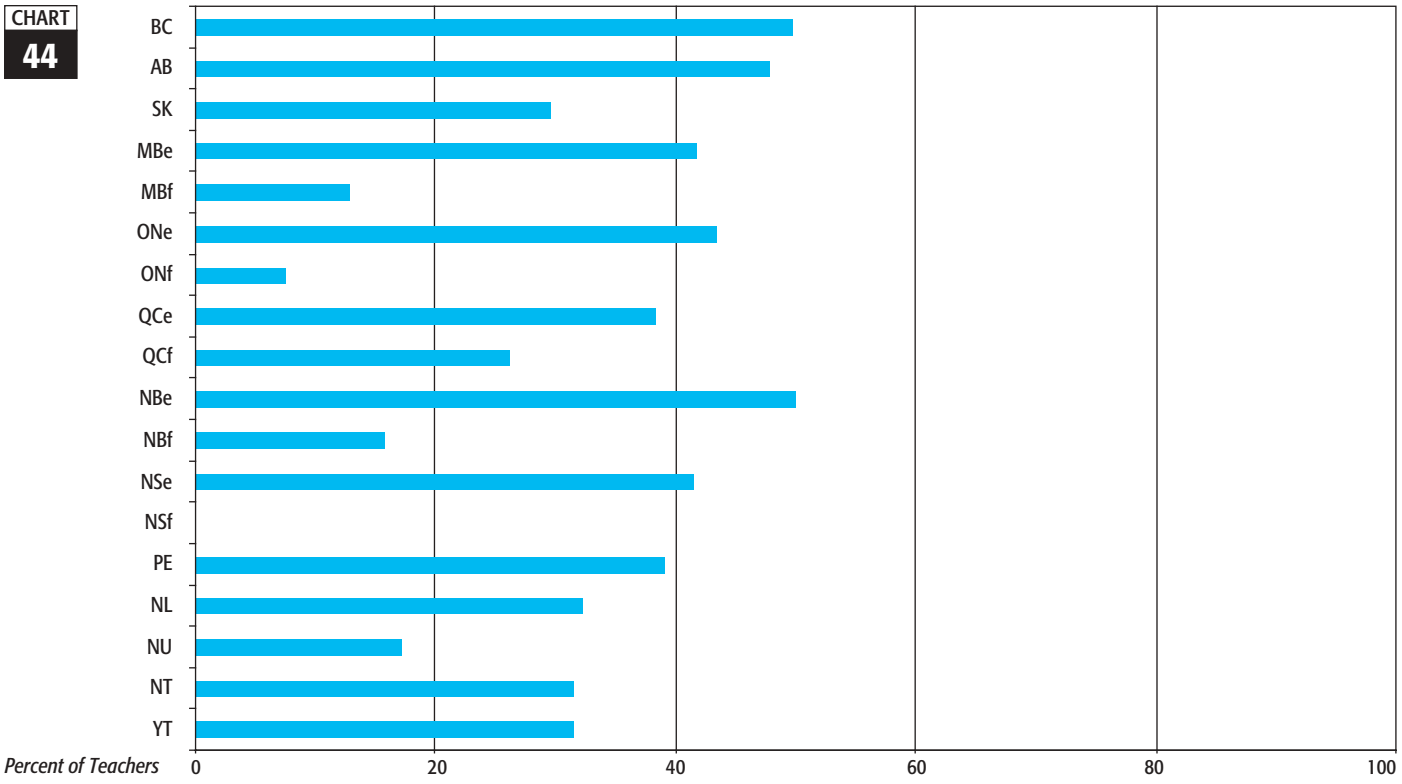
CHART 43



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Minutes	5	5	5	5	7.5	5	10	5	9	5	10	5	10	5	5	10	10	10

Percentage of teachers contacting parents once a month or more

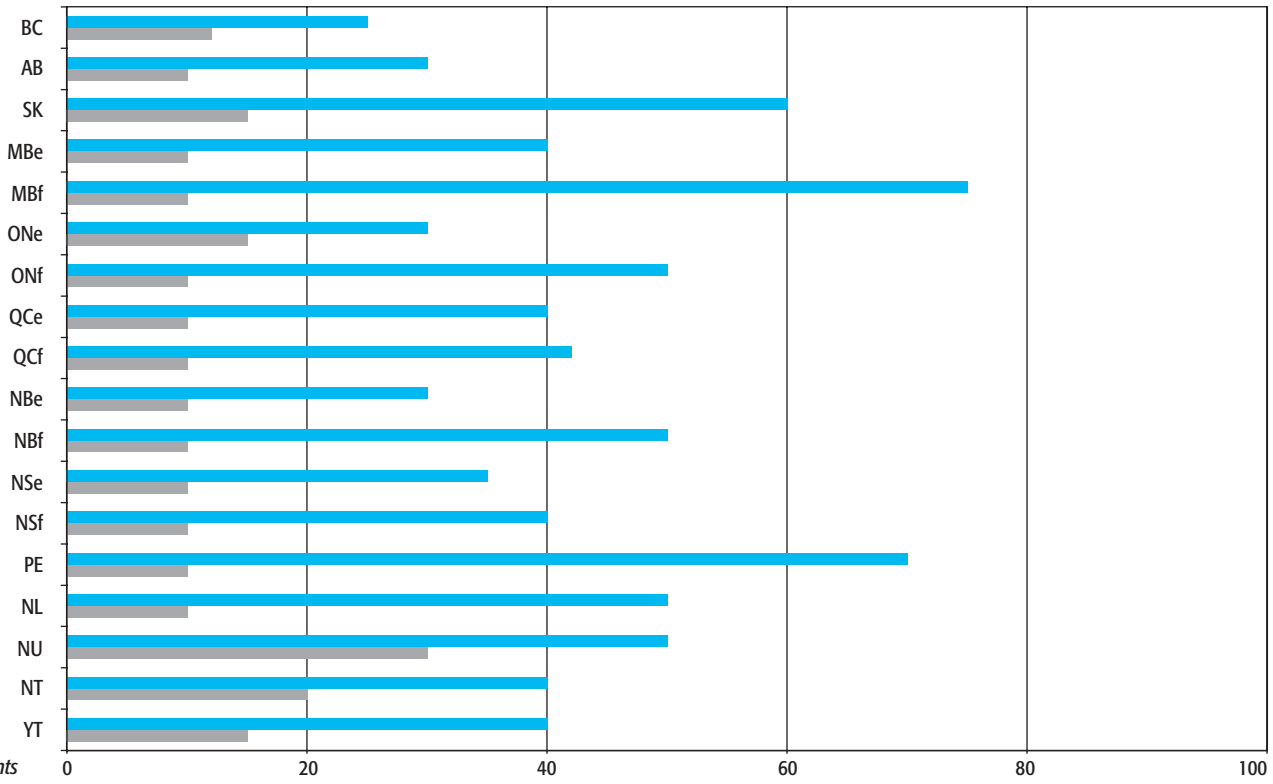
CHART 44



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	49	48	29	41	13	43	7	38	26	50	16	41	0	39	32	17	31	31

Median percentage of parents contacted during school year

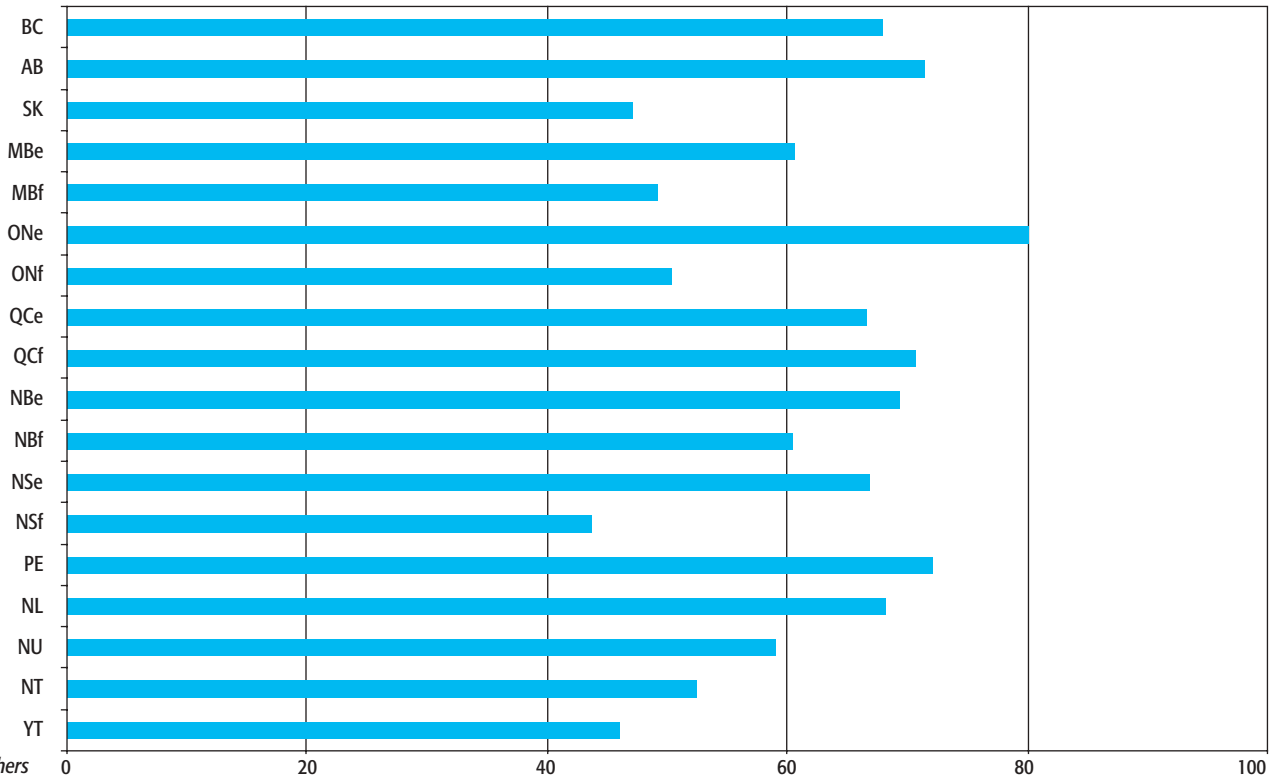
CHART 45



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Interviews	25	30	60	40	75	30	50	40	42	30	50	35	40	70	50	50	40	40
Others	12	10	15	10	10	15	10	10	10	10	10	10	10	10	10	30	20	15

Percentage of teachers meeting with other teachers once a month or more for planning

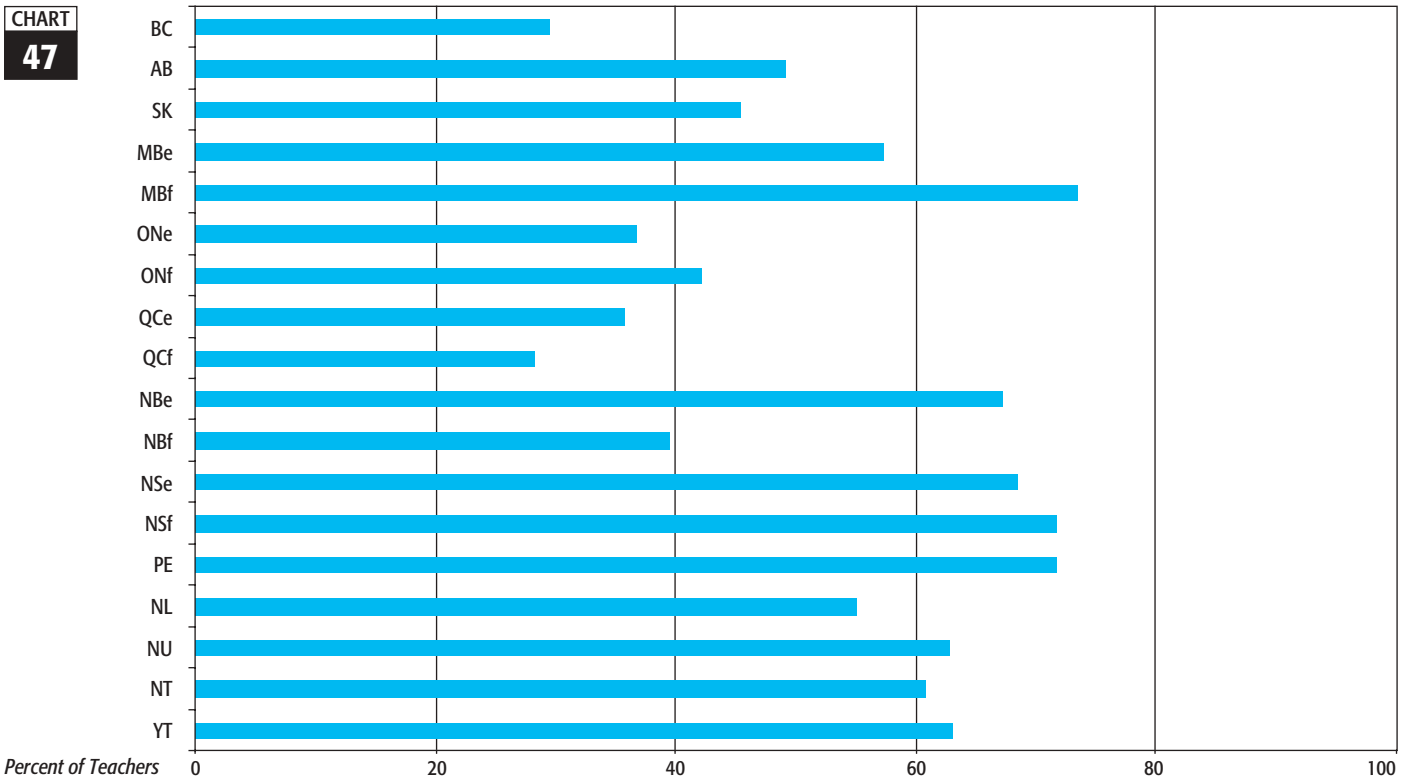
CHART 46



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	68	71	47	60	49	80	50	66	70	69	60	67	43	72	68	59	52	46

Percentage of teachers using manipulative materials in mathematics classes a few times a month or more

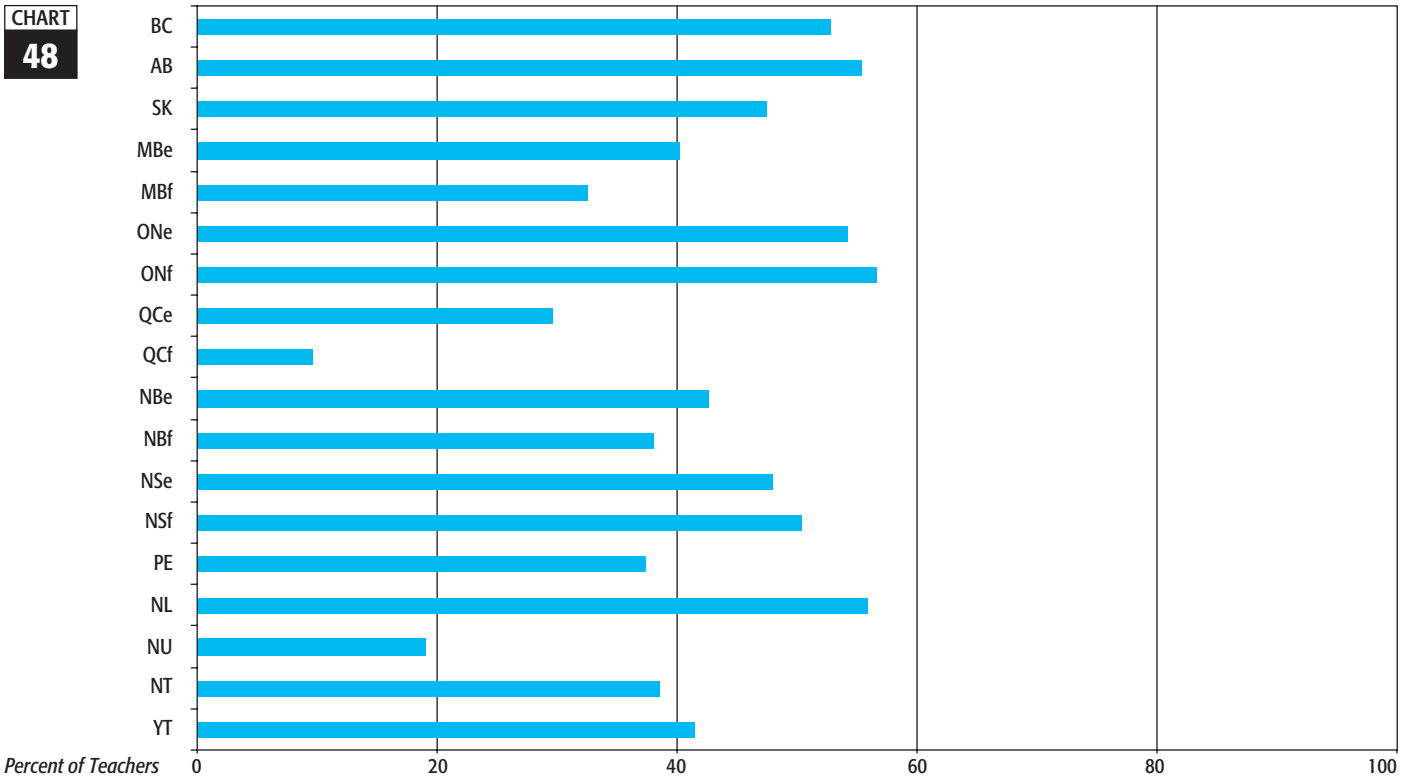
CHART 47



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	29	49	45	57	73	37	42	36	28	67	39	68	71	72	55	63	60	63

Percentage of teachers using graphing calculators in mathematics classes a few times a month or more

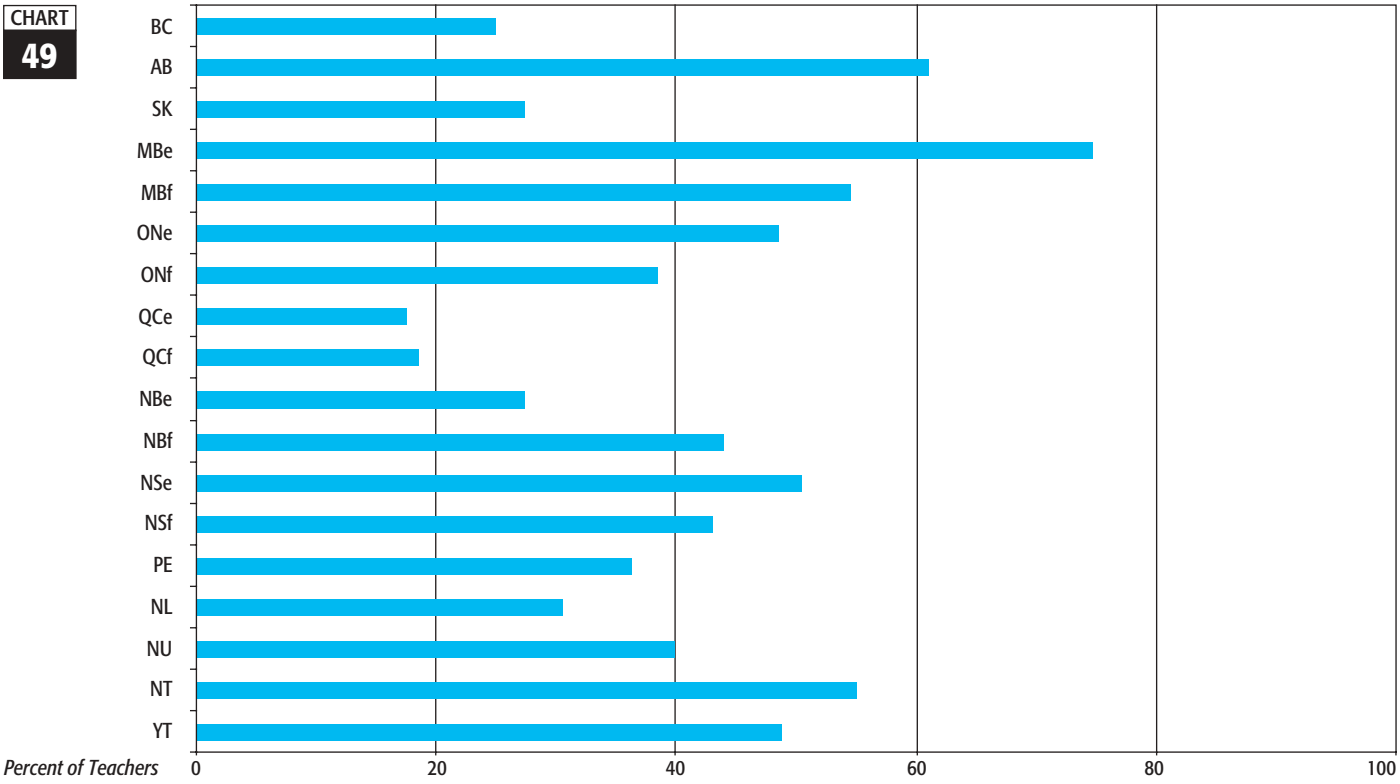
CHART 48



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	52	55	47	40	32	54	56	29	9	42	38	48	50	37	56	19	38	41

Percentage of teachers using computers in mathematics classes a few times a month or more

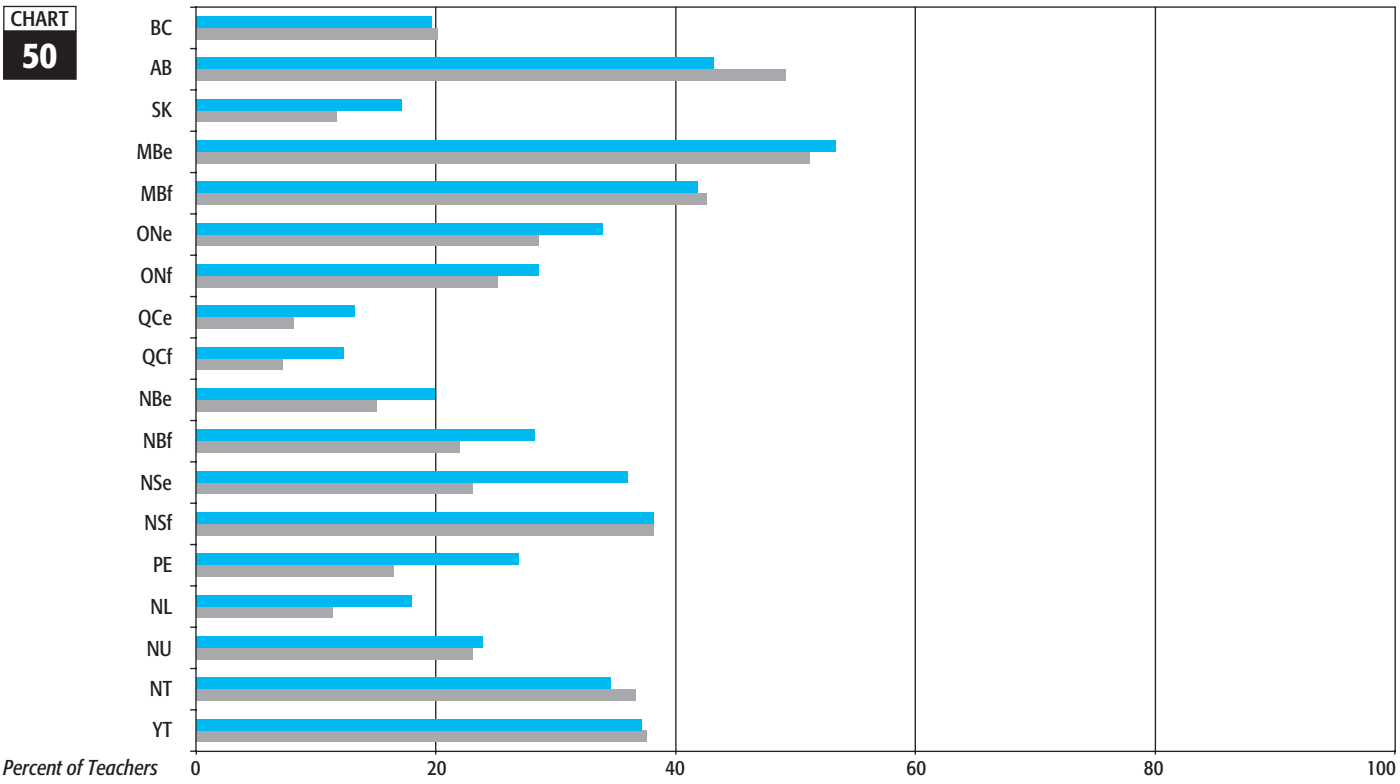
CHART 49



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	25	61	27	74	54	48	38	17	18	27	44	50	43	36	30	40	55	49

Percentage of teachers using instructional and standard software in mathematics classes a few times a month or more

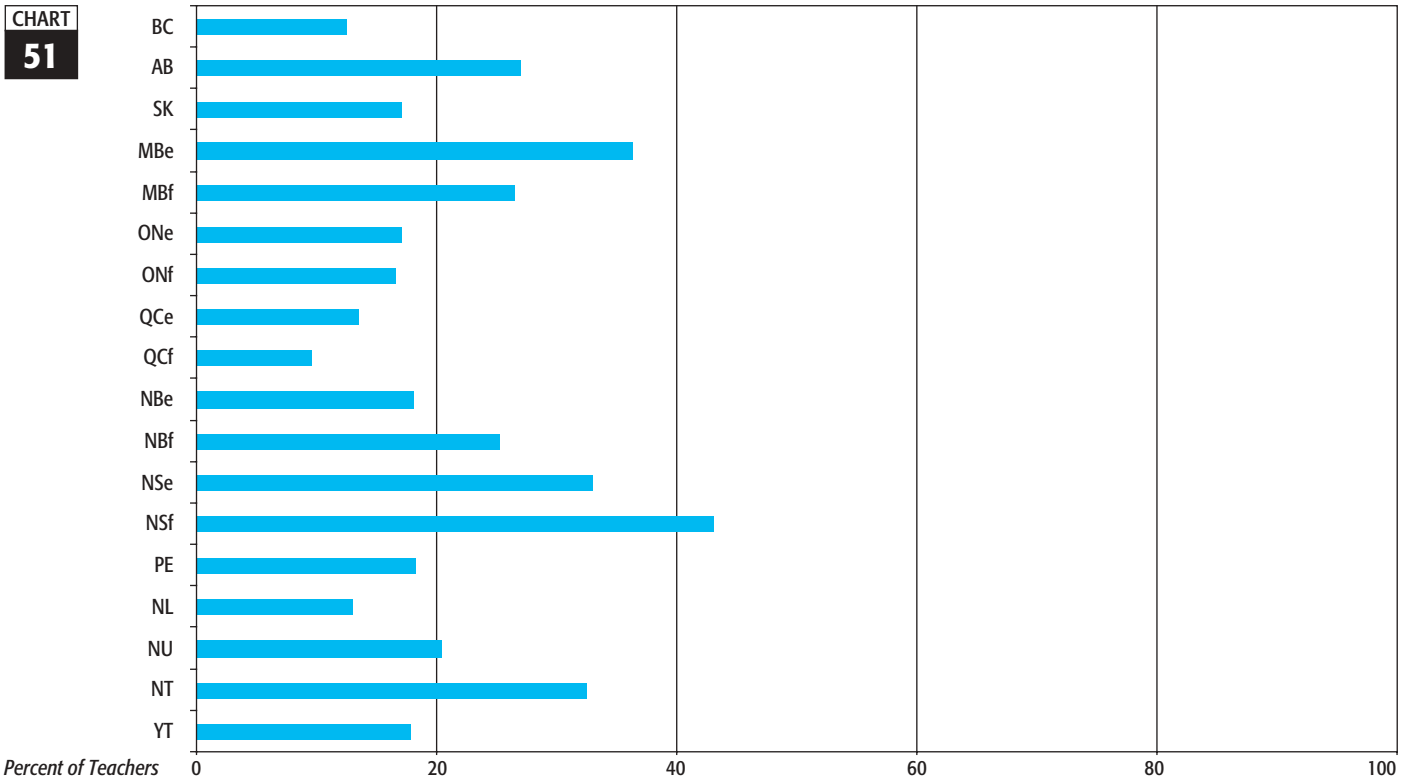
CHART 50



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Instructional	20	43	17	53	42	34	29	13	12	20	28	36	38	27	18	24	35	37
Standard	20	49	12	51	43	29	25	8	7	15	22	23	38	16	11	23	37	38

Percentage of teachers using the Internet in mathematics classes a few times a month or more

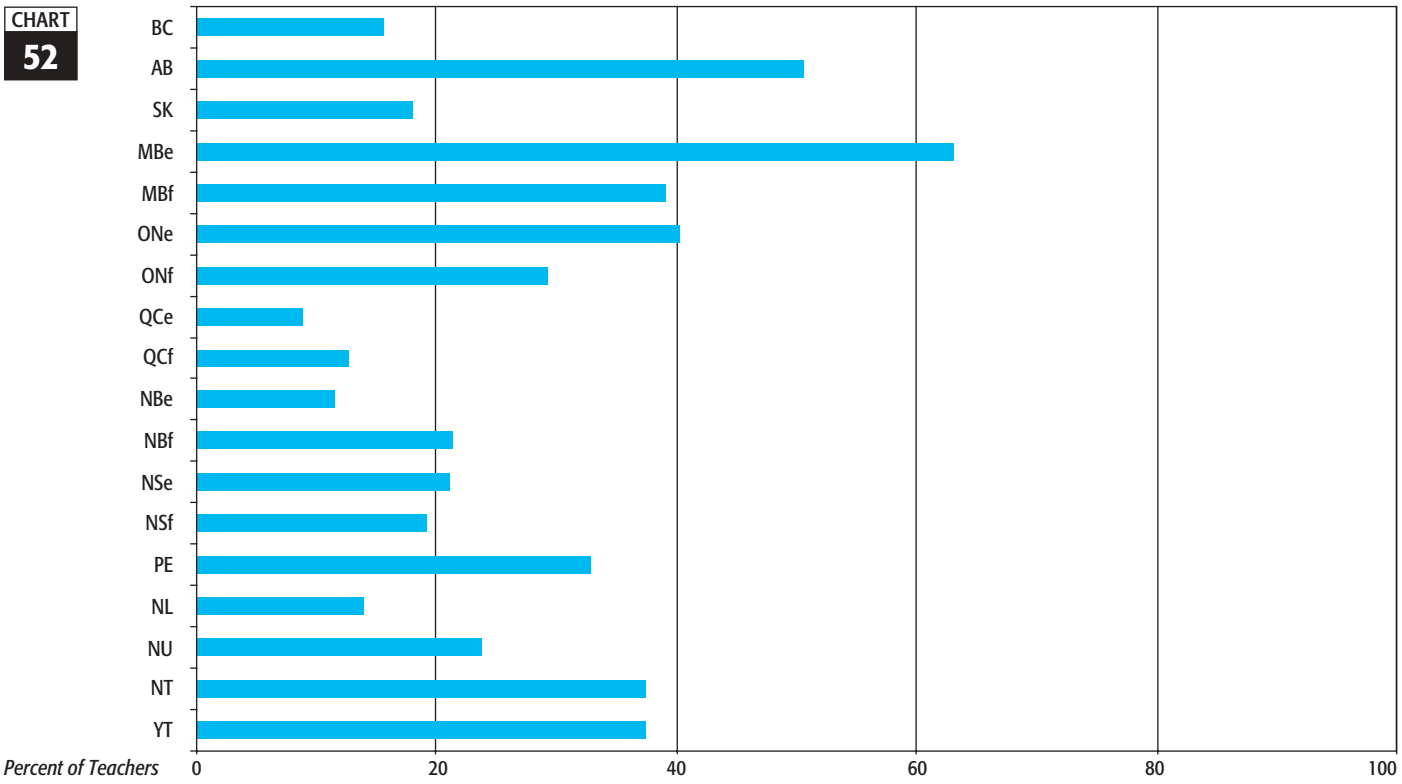
CHART 51



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	12	27	17	36	26	17	16	13	9	18	25	33	43	18	13	20	32	18

Percentage of teachers using computer lab in mathematics classes a few times a month or more

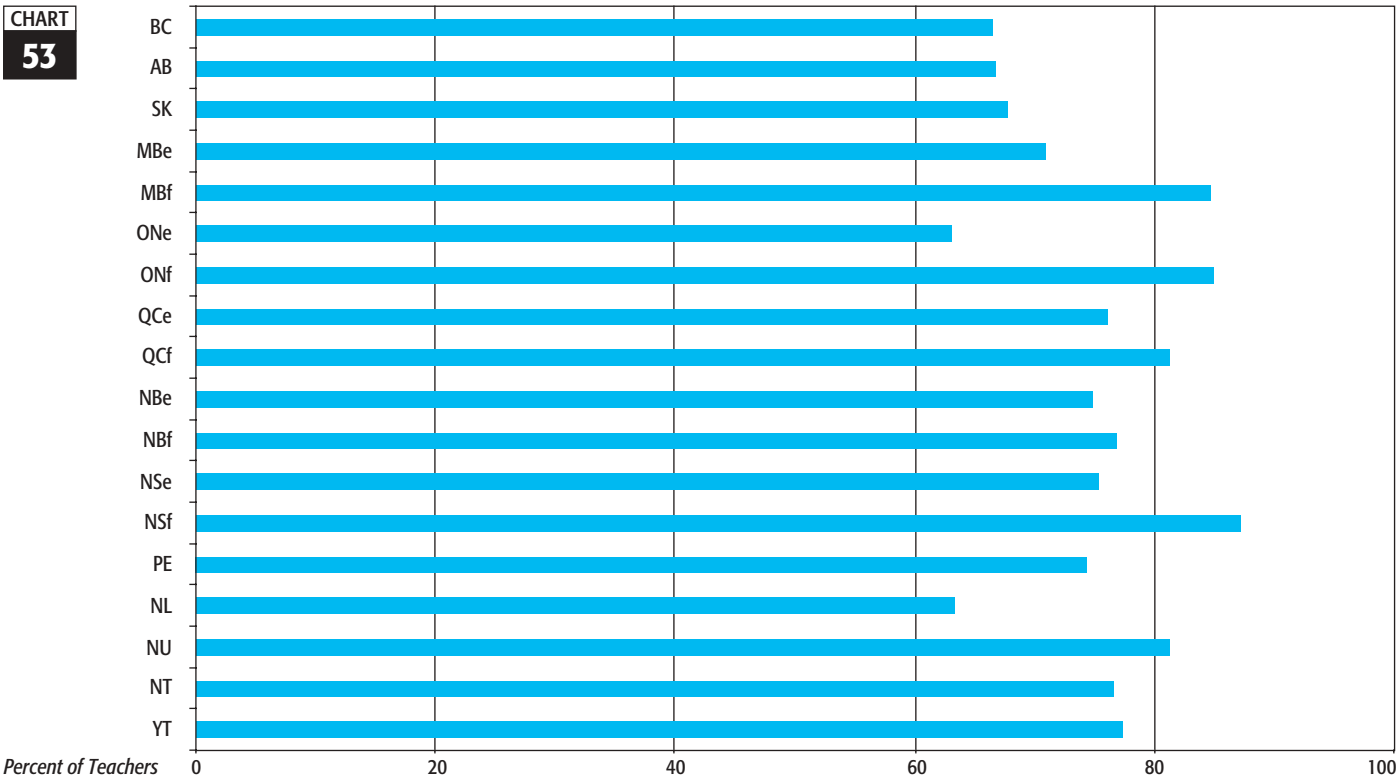
CHART 52



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	15	50	18	63	39	40	29	9	13	11	21	21	19	33	14	24	37	37

Percentage of teachers for whom range of student abilities presents a major challenge in mathematics teaching

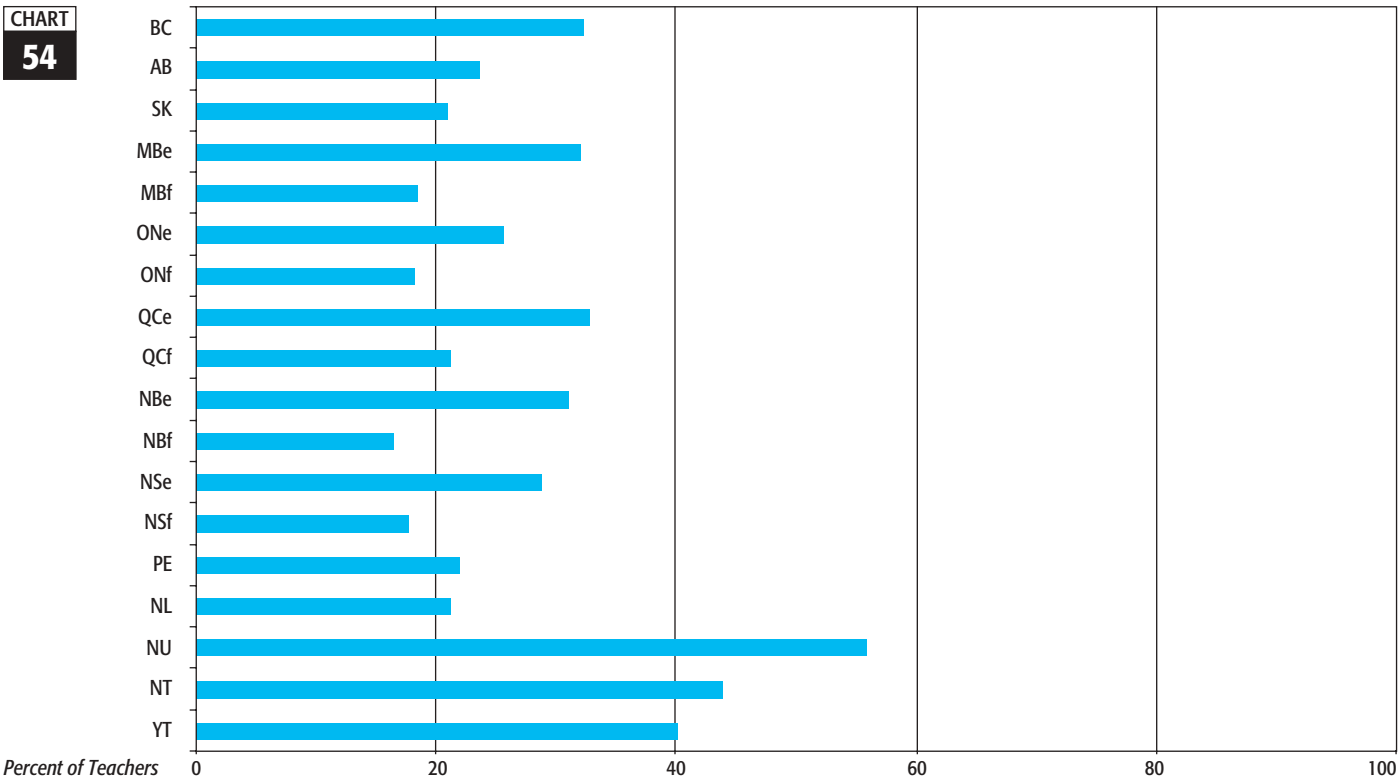
CHART 53



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	66	66	68	71	84	63	85	76	81	75	77	75	87	74	63	81	76	77

Percentage of teachers for whom range of student backgrounds presents a major challenge in mathematics teaching

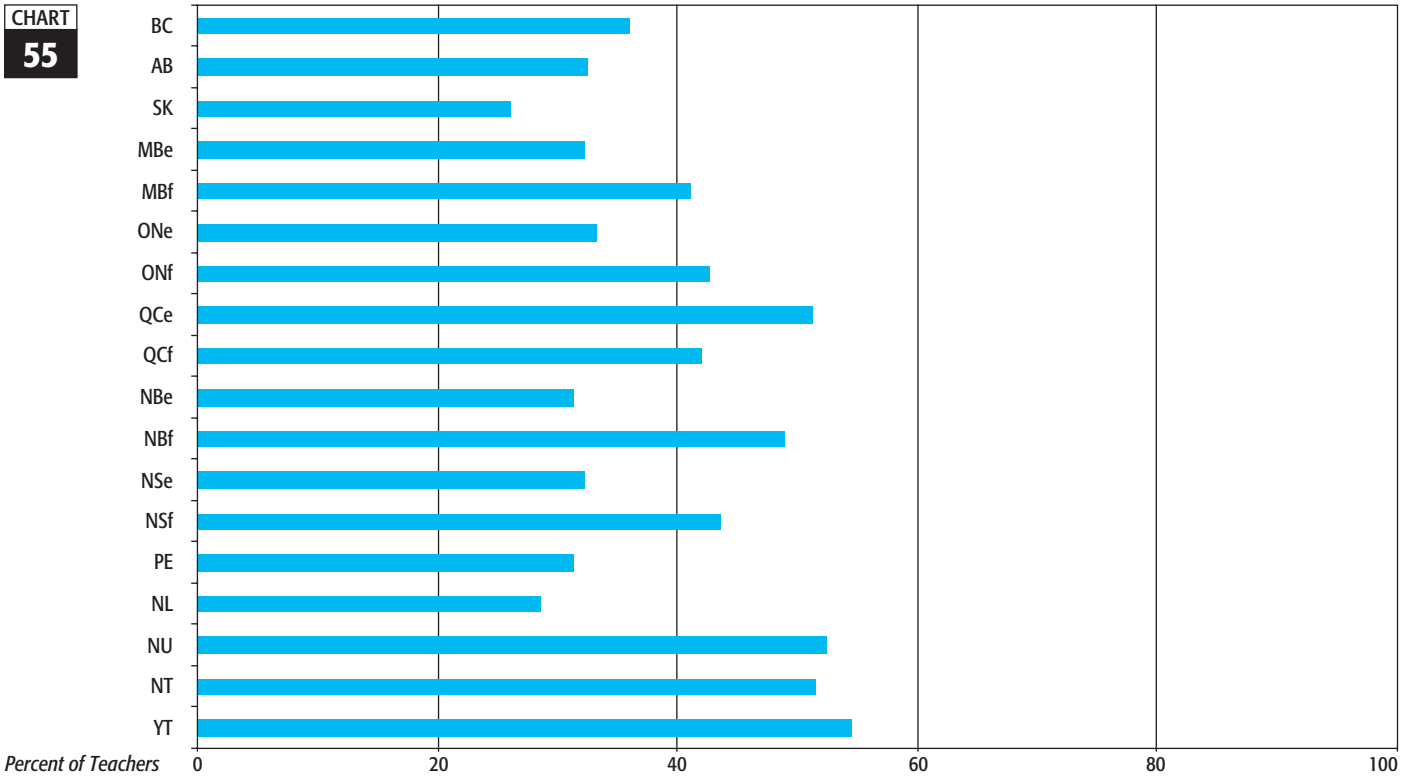
CHART 54



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	32	23	21	32	18	25	18	33	21	31	16	29	17	22	21	56	44	40

Percentage of teachers for whom students with special needs present a major challenge in mathematics teaching

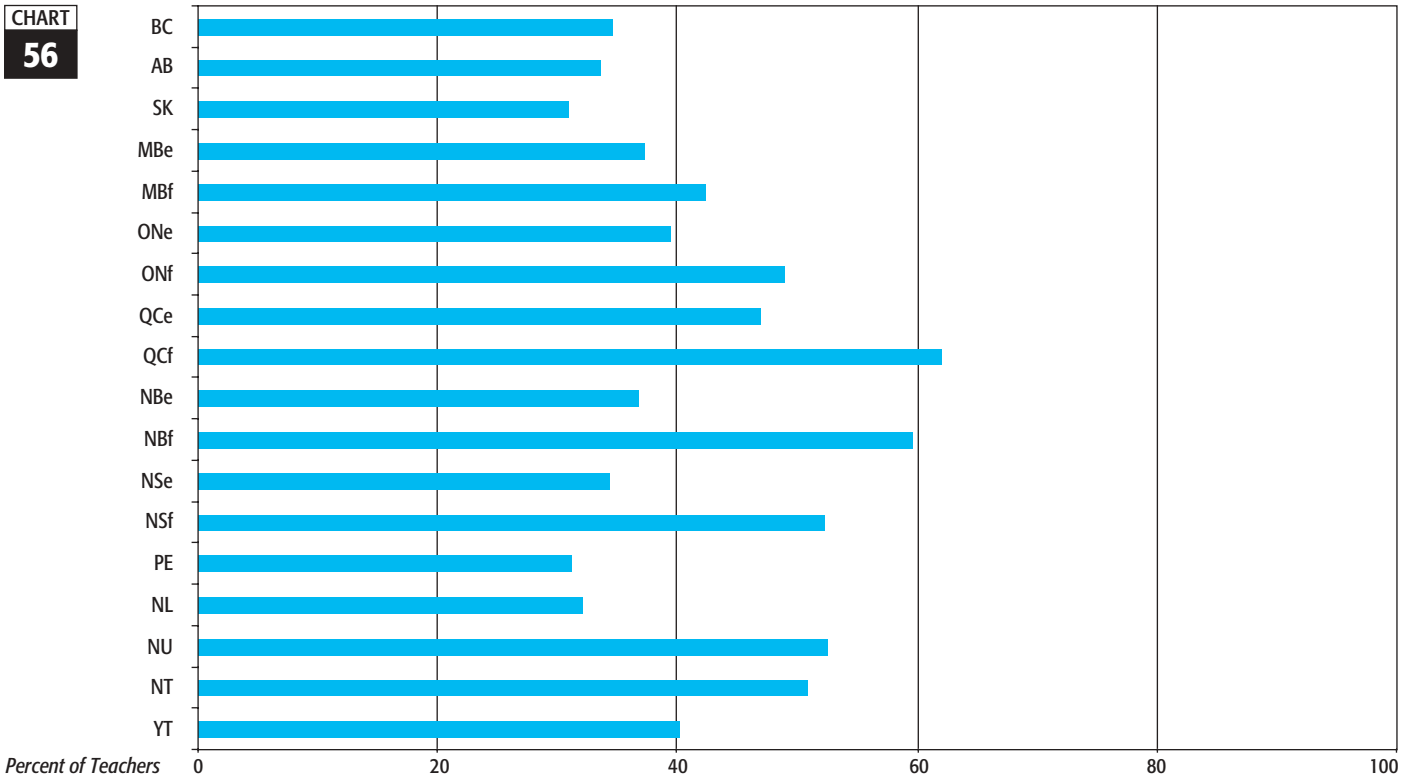
CHART 55



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	36	32	26	32	41	33	42	51	42	31	49	32	43	31	28	52	51	54

Percentage of teachers for whom disruptive students present a major challenge in mathematics teaching

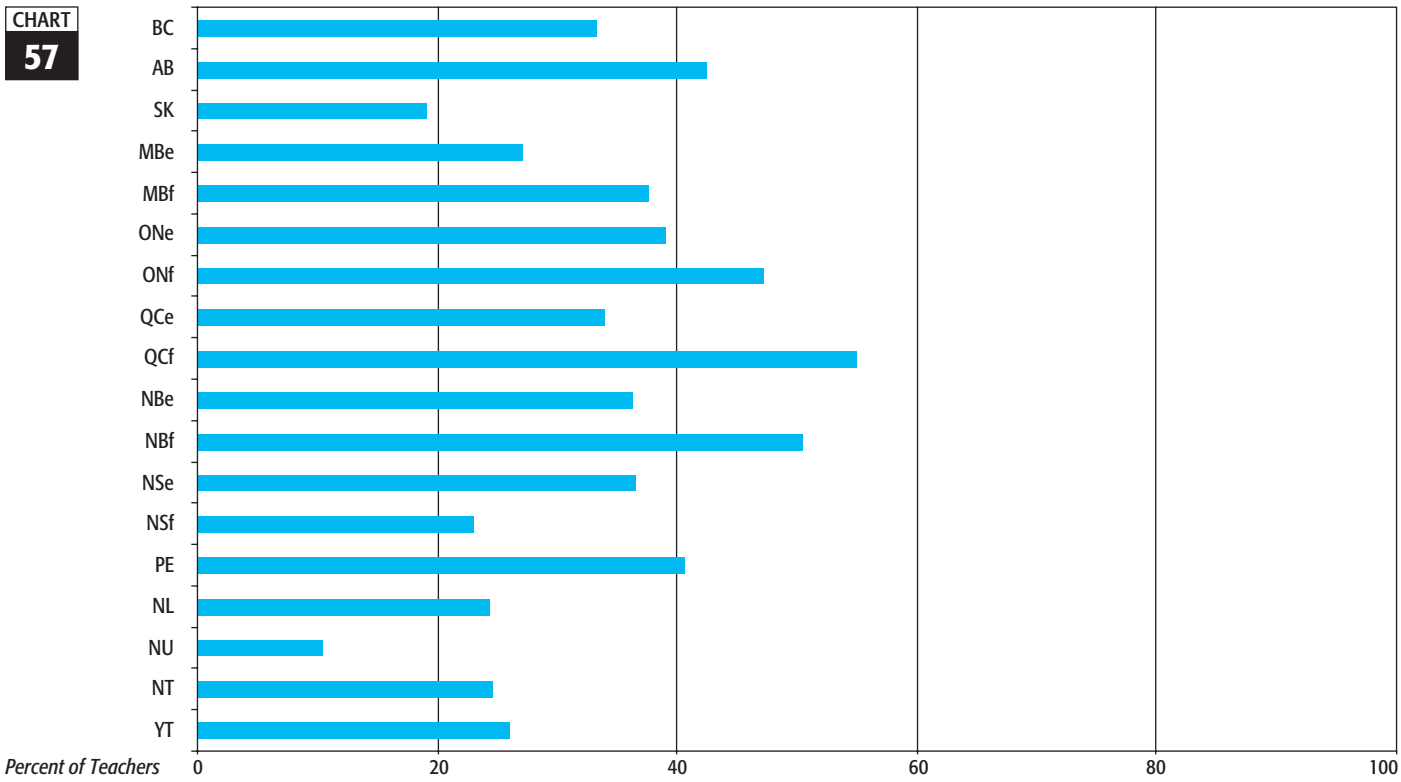
CHART 56



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	34	33	31	37	42	39	49	47	62	37	59	34	52	31	32	52	51	40

Percentage of teachers for whom large class size presents a major challenge in mathematics teaching

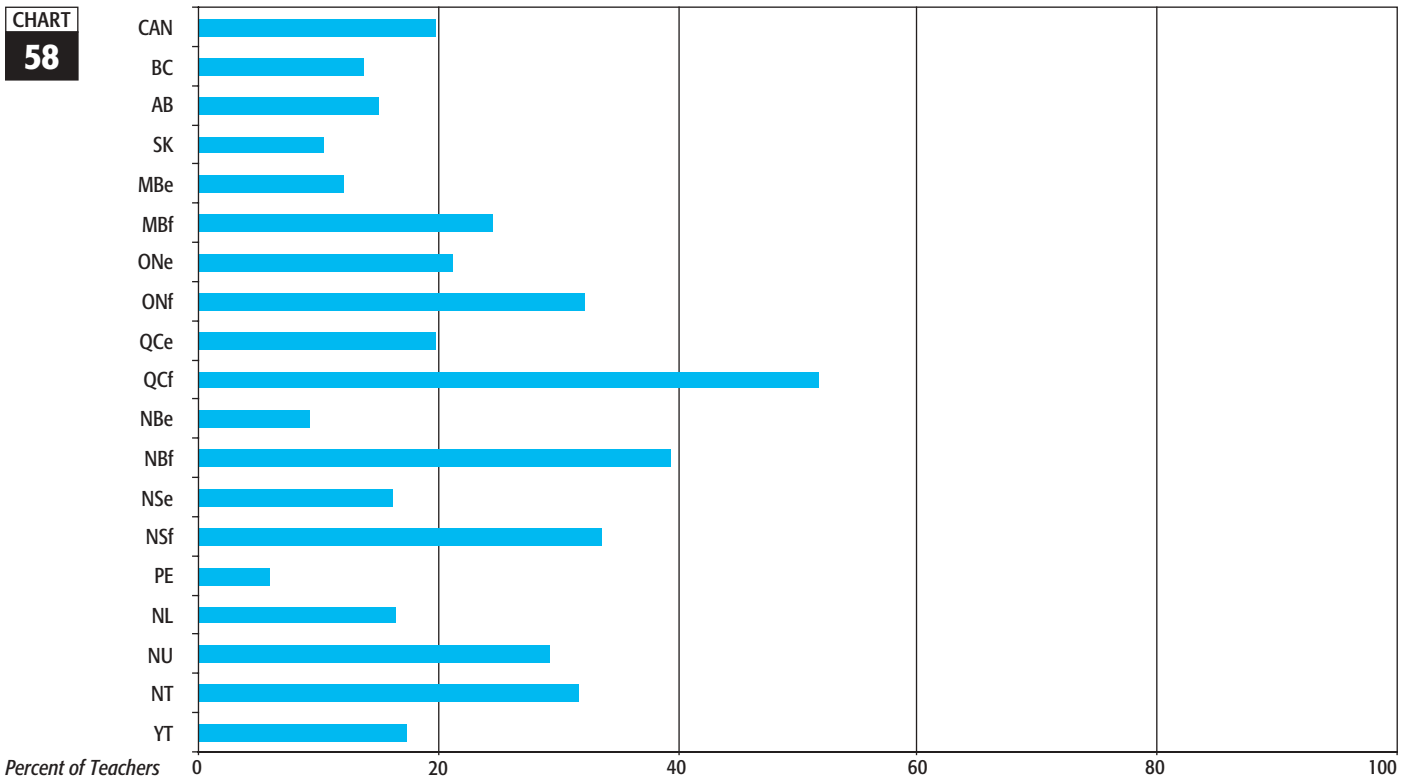
CHART 57



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	33	42	19	27	38	39	47	34	55	36	50	36	23	41	24	10	24	26

Percentage of teachers for whom low school morale presents a major challenge in mathematics teaching

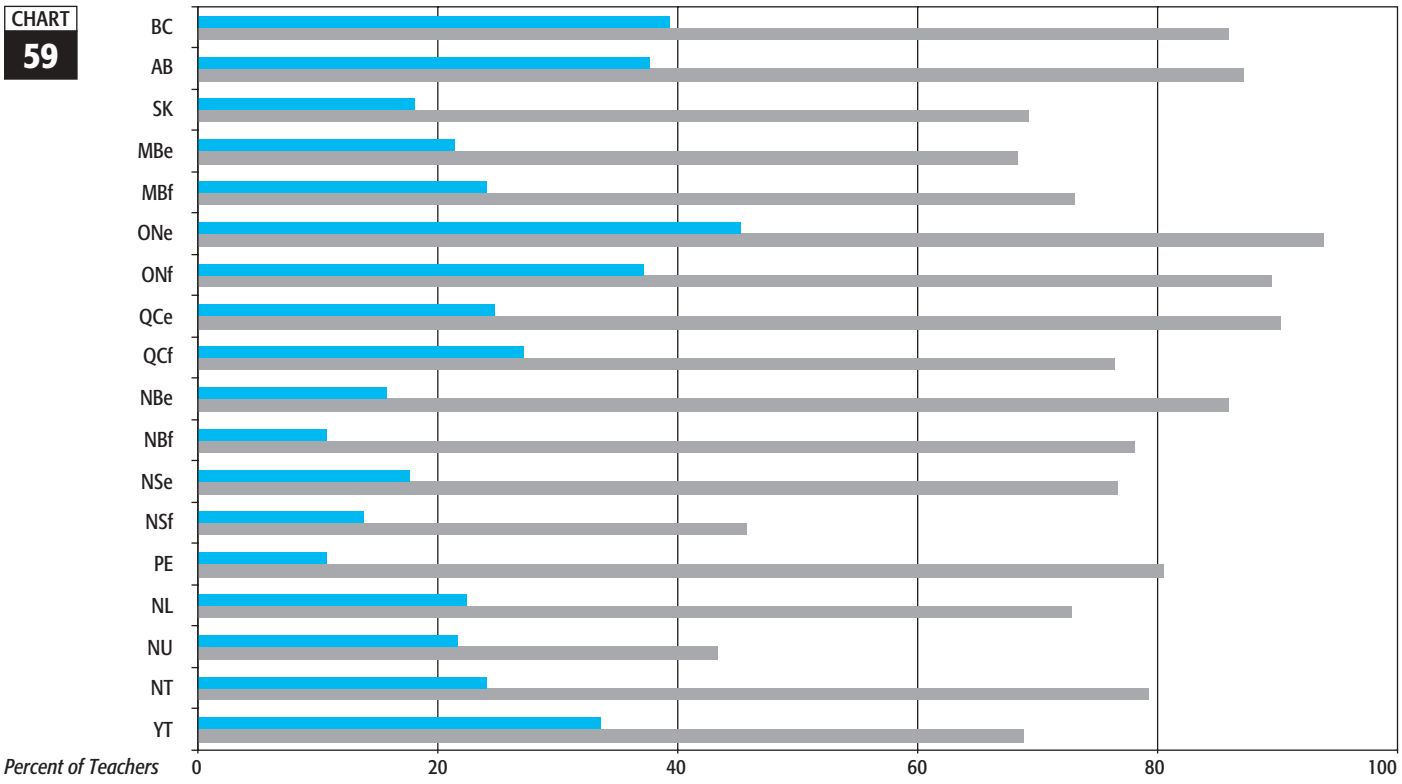
CHART 58



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	20	14	15	10	12	24	21	32	20	52	9	39	16	33	6	16	29	31	17

Percentage of teachers assigning 30 minutes or more of homework and assigning homework 3–4 times a week or more

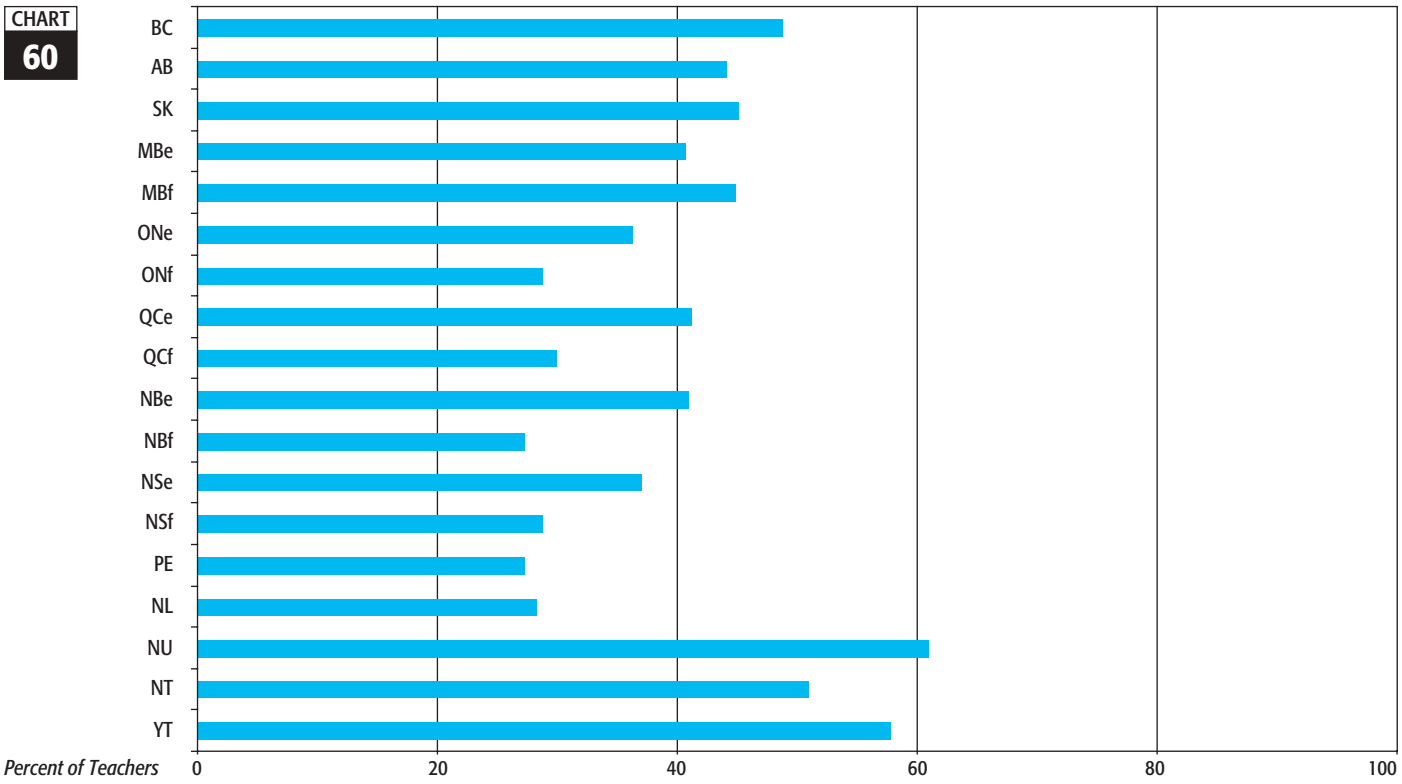
CHART 59



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
30 minutes or more	39	37	18	21	24	45	37	24	27	16	11	17	14	10	22	21	24	33
3-4 times a week or more	86	87	69	68	73	94	89	90	76	86	78	77	45	80	73	43	79	69

Percentage of teachers who collect, correct, and return homework a few times a week or more

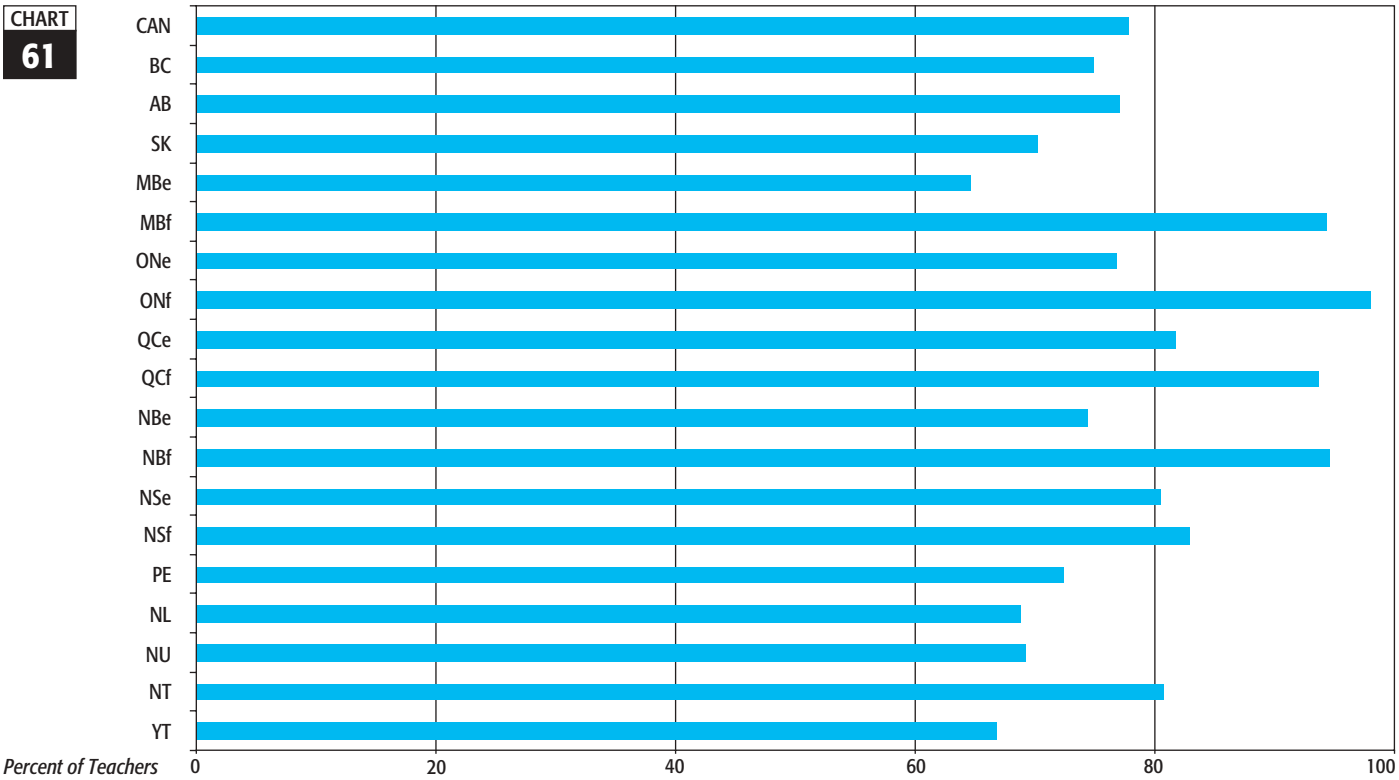
CHART 60



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	48	44	45	40	45	36	29	41	30	41	27	37	29	27	28	61	51	58

Percentage of teachers giving feedback on homework to the whole class a few times a week or more

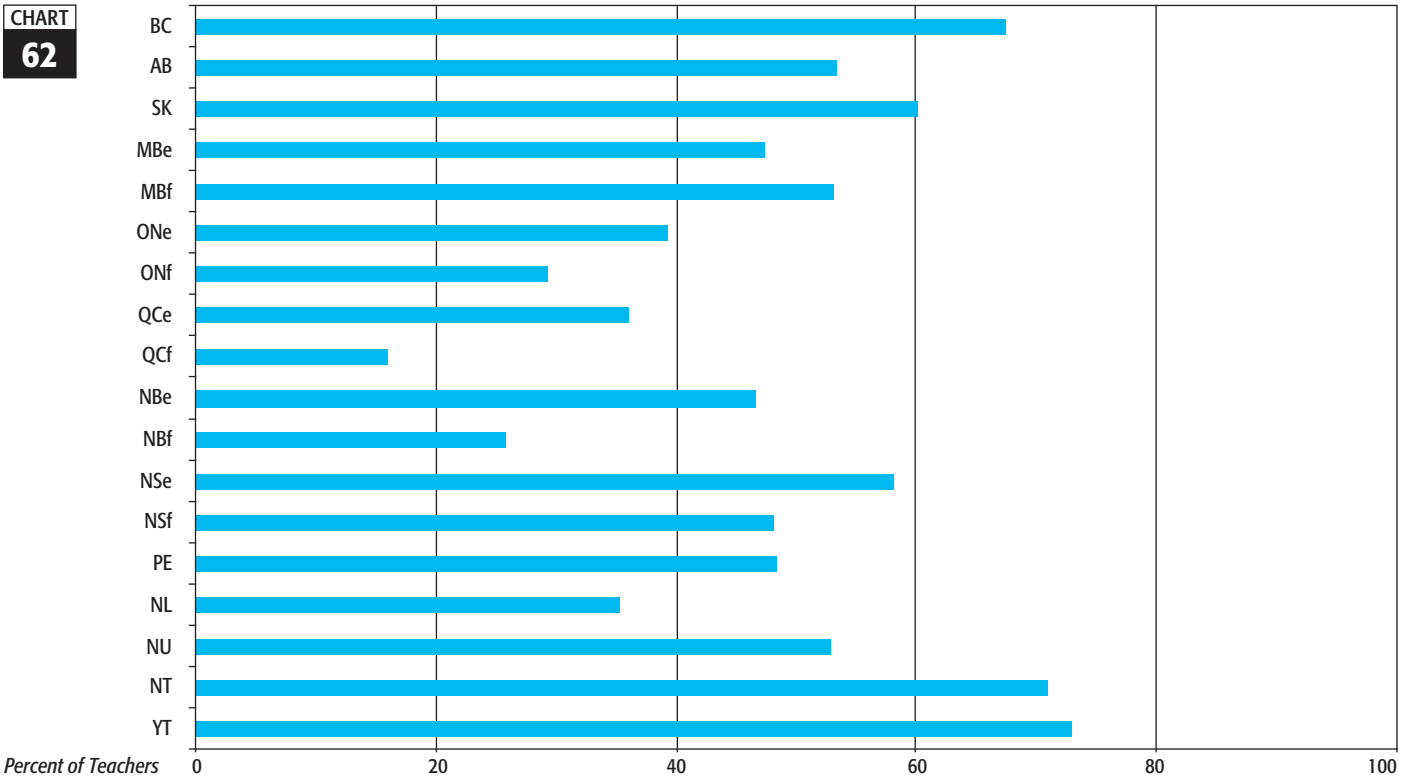
CHART 61



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	78	75	77	70	64	94	77	98	81	93	74	94	80	83	72	68	69	80	67

Percentage of teachers using homework to contribute to student grades a few times a week or more

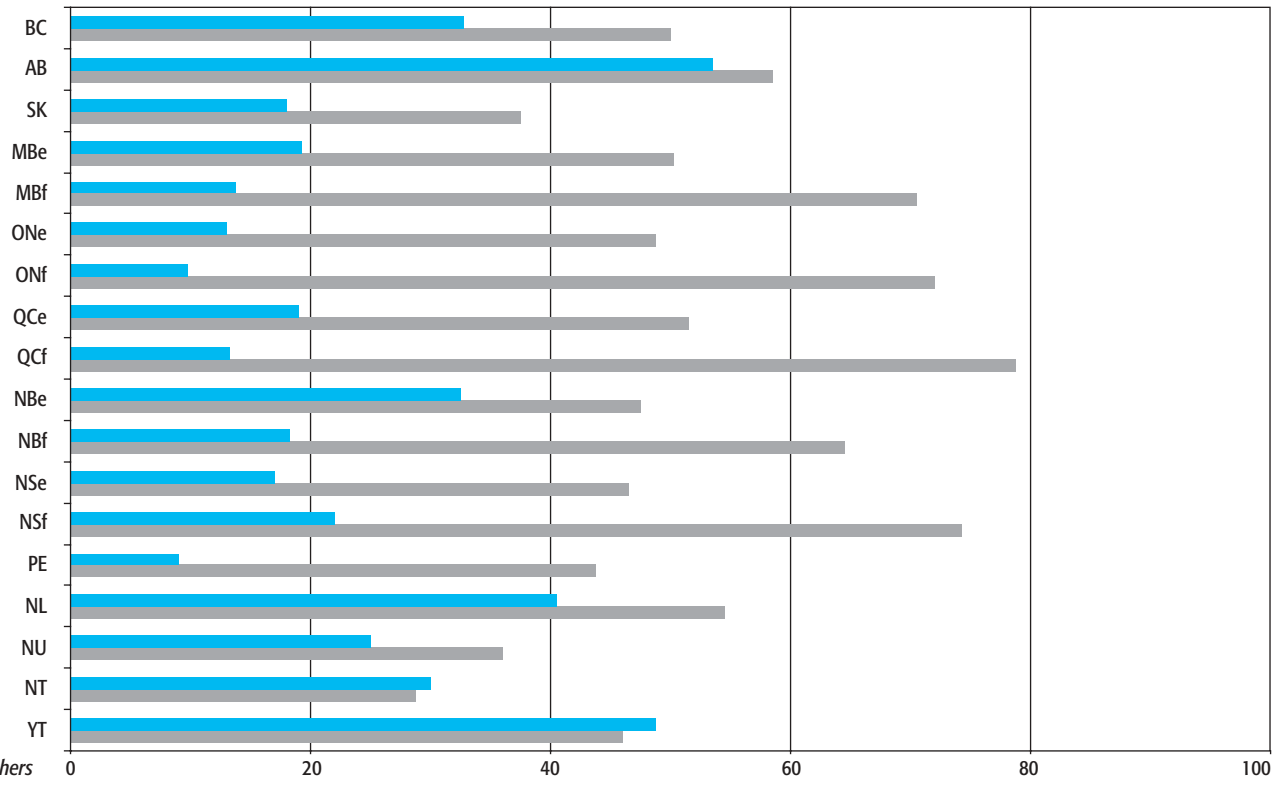
CHART 62



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	67	53	60	47	53	39	29	36	16	46	26	58	48	48	35	53	71	73

Percentage of teachers giving quite a lot or a great deal of weight to teacher-made multiple choice or other objectively scored tests or short-answer/essay tests in assigning student grades

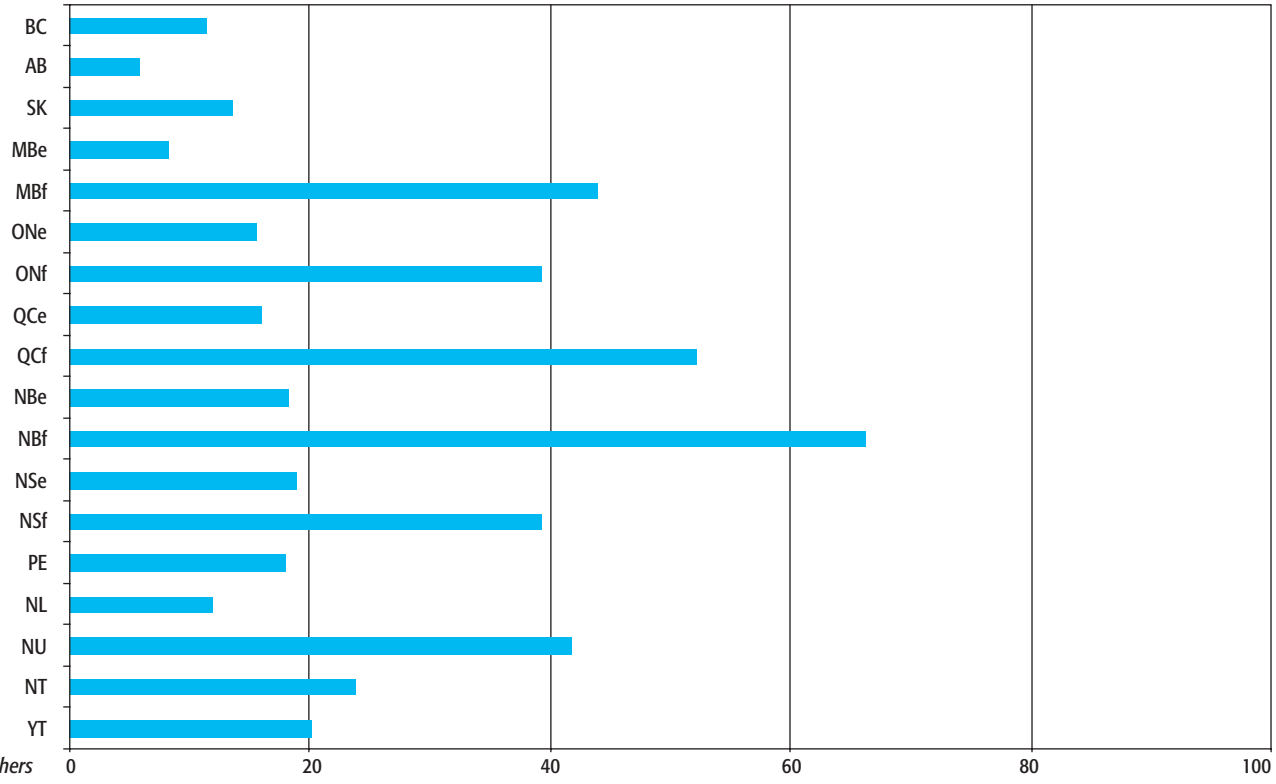
CHART 63



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
MC and Similar	33	53	18	19	14	13	9	19	13	32	18	17	22	9	40	25	30	49
Short Answer/Essay	50	58	37	50	70	49	72	51	78	47	64	46	74	44	54	36	29	46

Percentage of teachers giving quite a lot or a great deal of weight to class attendance in assigning student grades

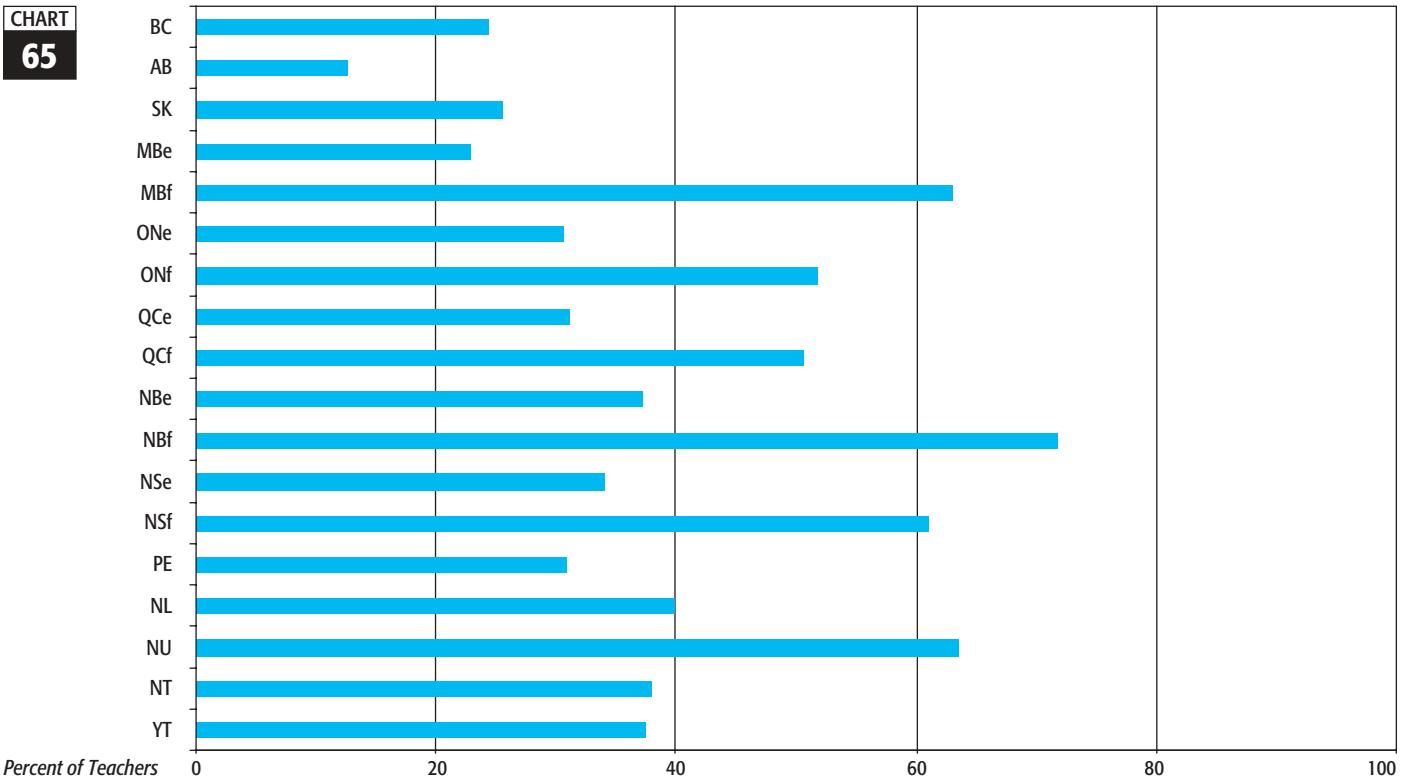
CHART 64



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	11	6	13	8	44	15	39	16	52	18	66	19	39	18	12	42	24	20

Percentage of teachers giving quite a lot or a great deal of weight to improvement over the year or term in assigning student grades

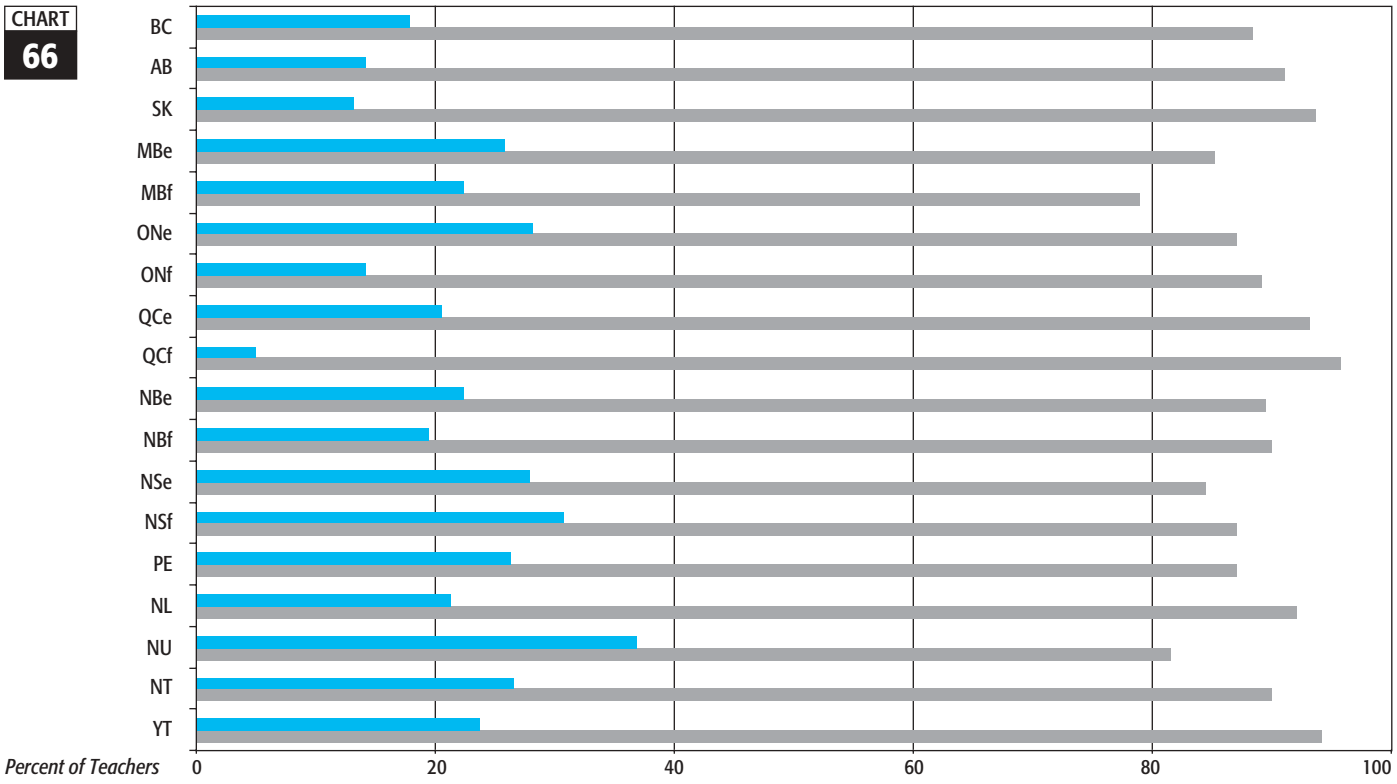
CHART 65



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	24	13	25	23	63	30	52	31	50	37	72	34	61	31	40	63	38	37

Percentage of teachers agreeing that it is appropriate to use calculators in mathematics from the earliest grades or only after mastering basic skills

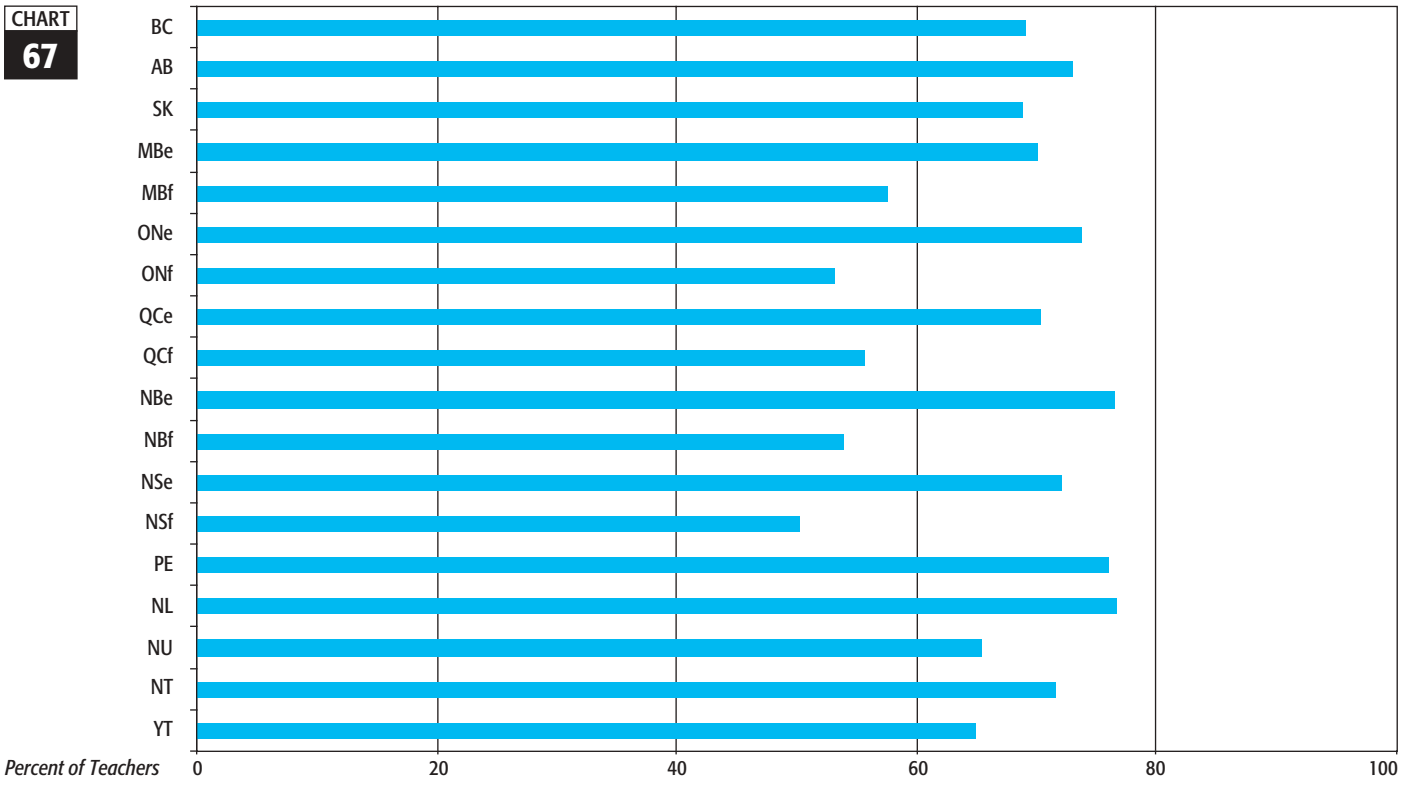
CHART 66



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
From earliest grades	18	14	13	26	22	28	14	20	5	22	19	28	30	26	21	36	26	24
After mastering basic skills	88	91	93	85	79	87	89	93	95	89	90	84	87	87	92	81	90	94

Percentage of teachers agreeing that there are limits to what a teacher can accomplish because student ability has a large influence on achievement

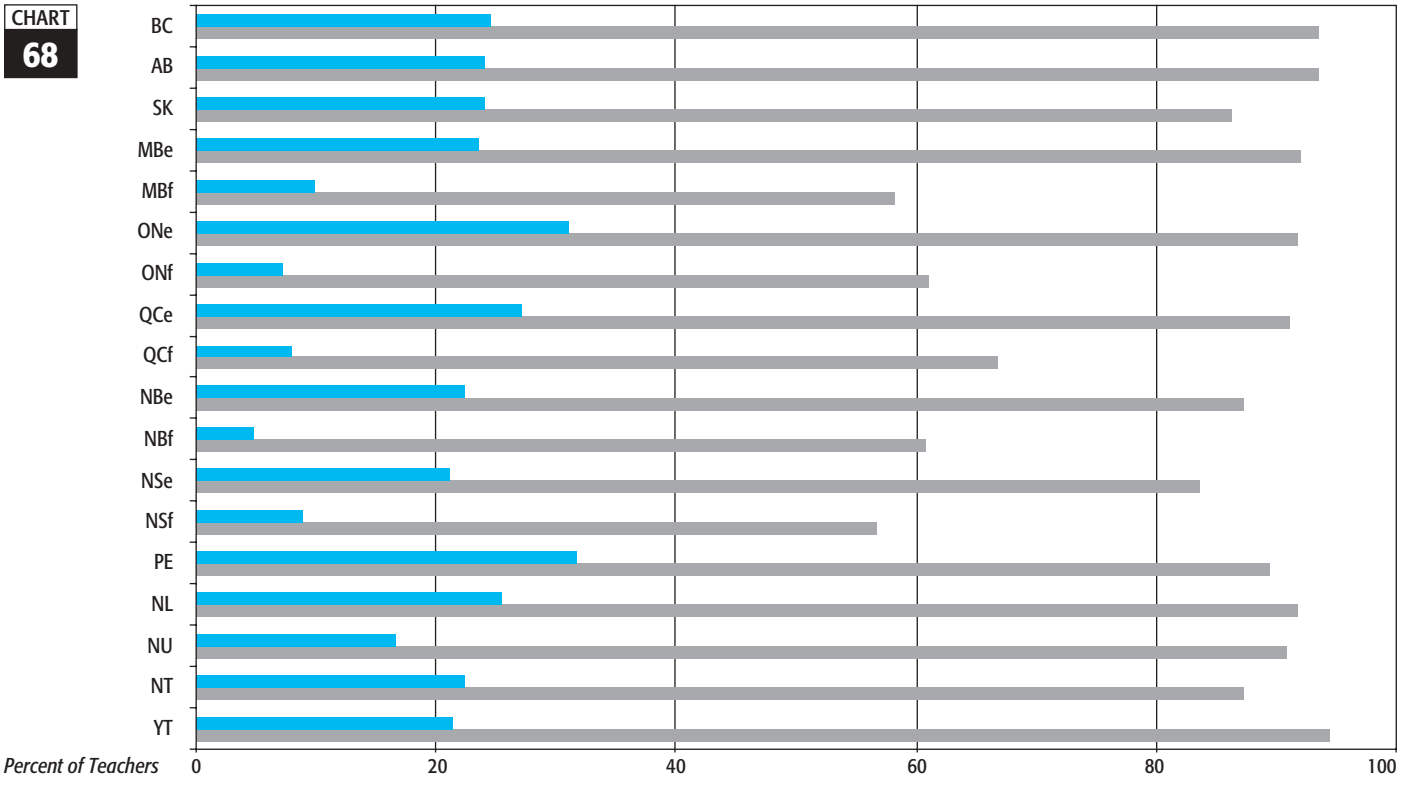
CHART 67



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	69	73	69	70	57	74	53	70	55	76	54	72	50	76	76	65	71	65

Percentage of teachers agreeing that students need natural talent or hard work to do well in mathematics courses

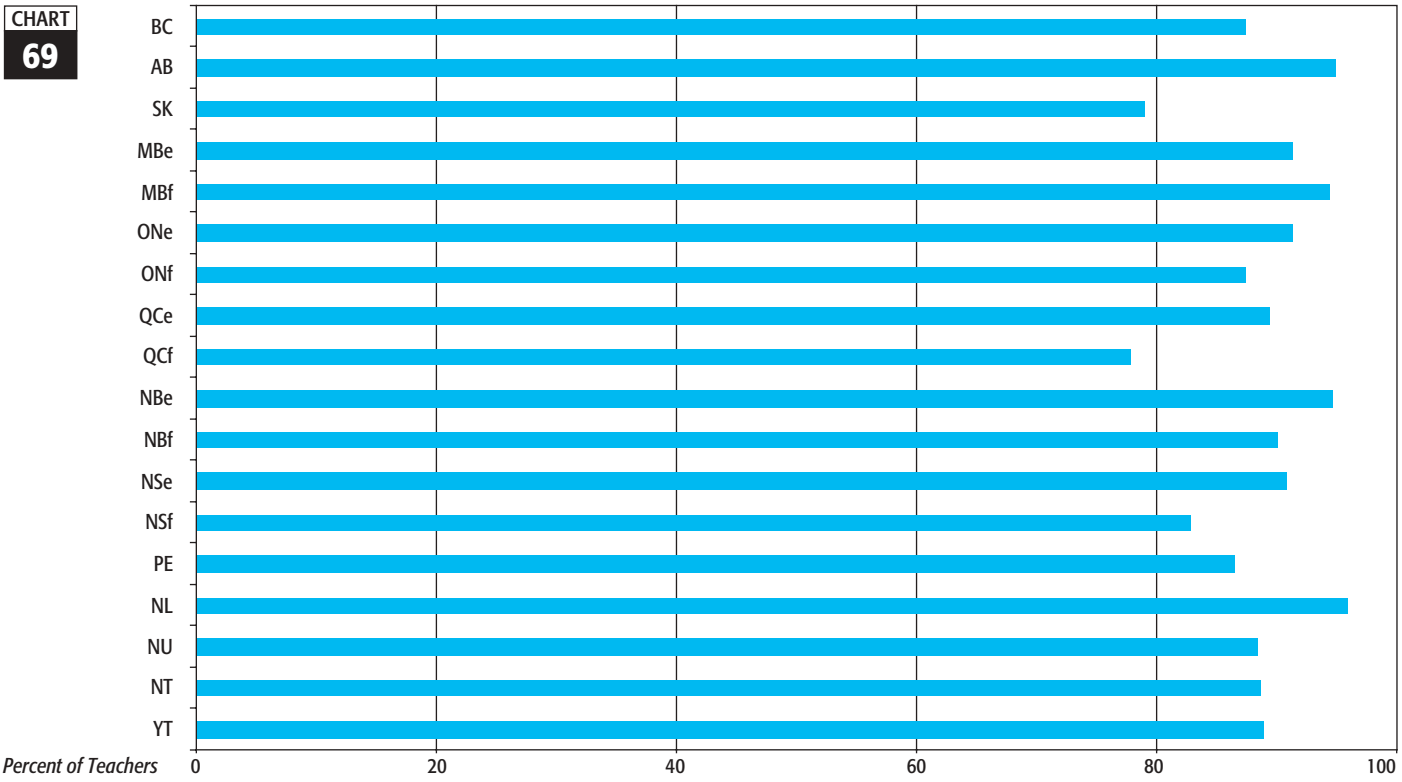
CHART 68



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Natural talent	24	24	24	23	10	31	7	27	8	22	4	21	9	31	25	16	22	21
Hard work	93	93	86	92	58	92	61	91	67	87	61	83	57	89	92	91	87	94

Percentage of teachers agreeing that high school students should be streamed into different programs based on their abilities

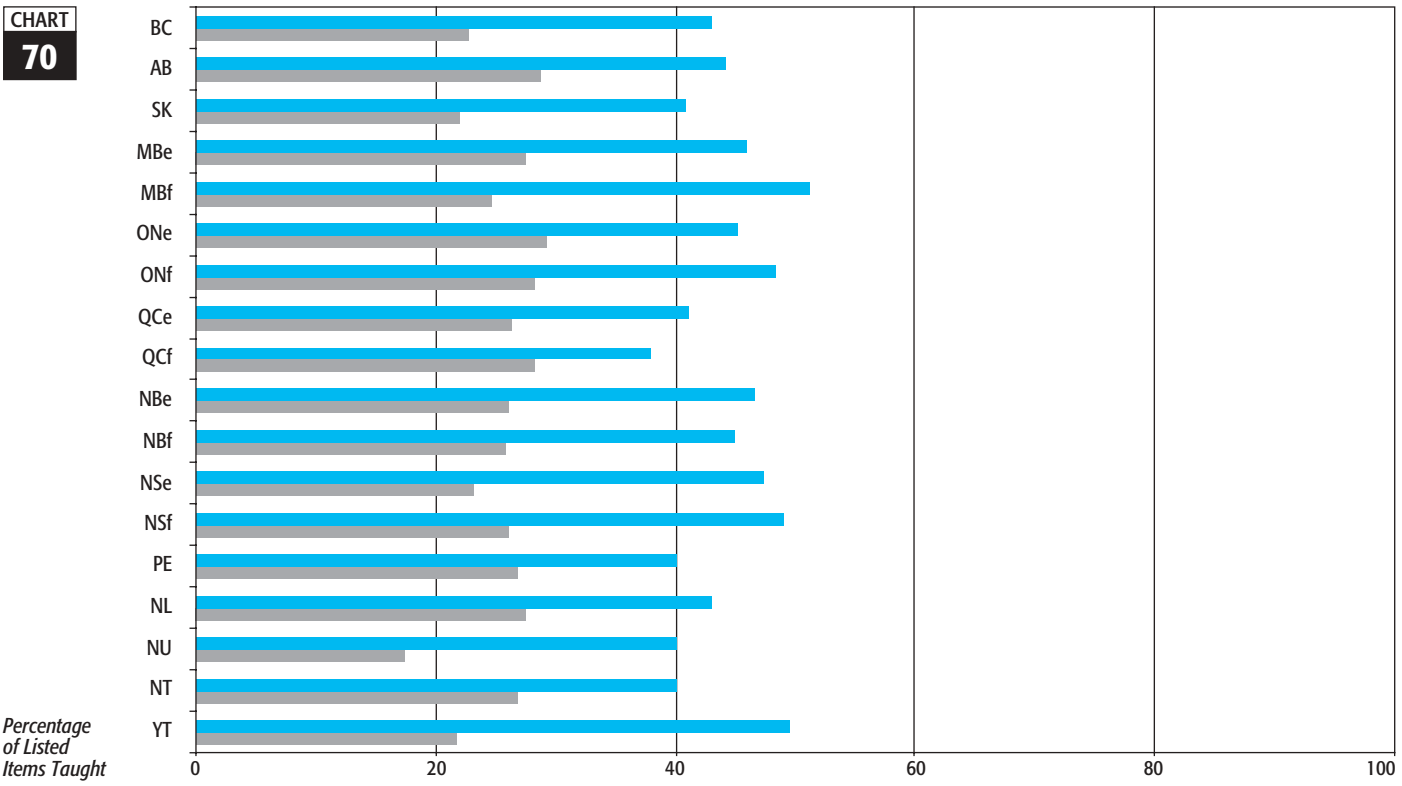
CHART 69



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	87	95	79	91	94	91	87	89	78	94	90	91	83	86	96	88	88	89

Mean opportunity to learn: 13-year-olds

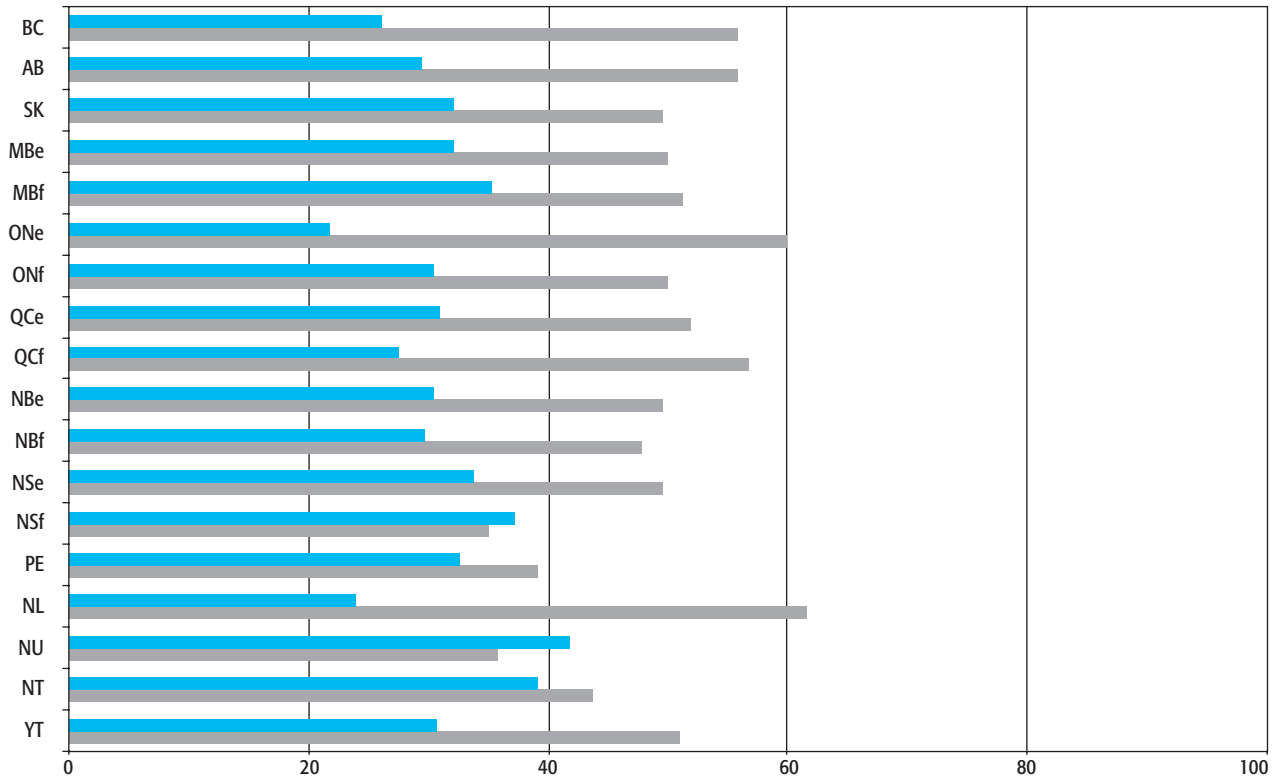
CHART 70



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
This year	43	44	41	46	51	45	48	41	38	46	45	47	49	40	43	40	40	49
Previous years	23	28	21	27	24	29	28	26	28	26	26	23	26	27	27	17	26	22

Mean opportunity to learn: 16-year-olds

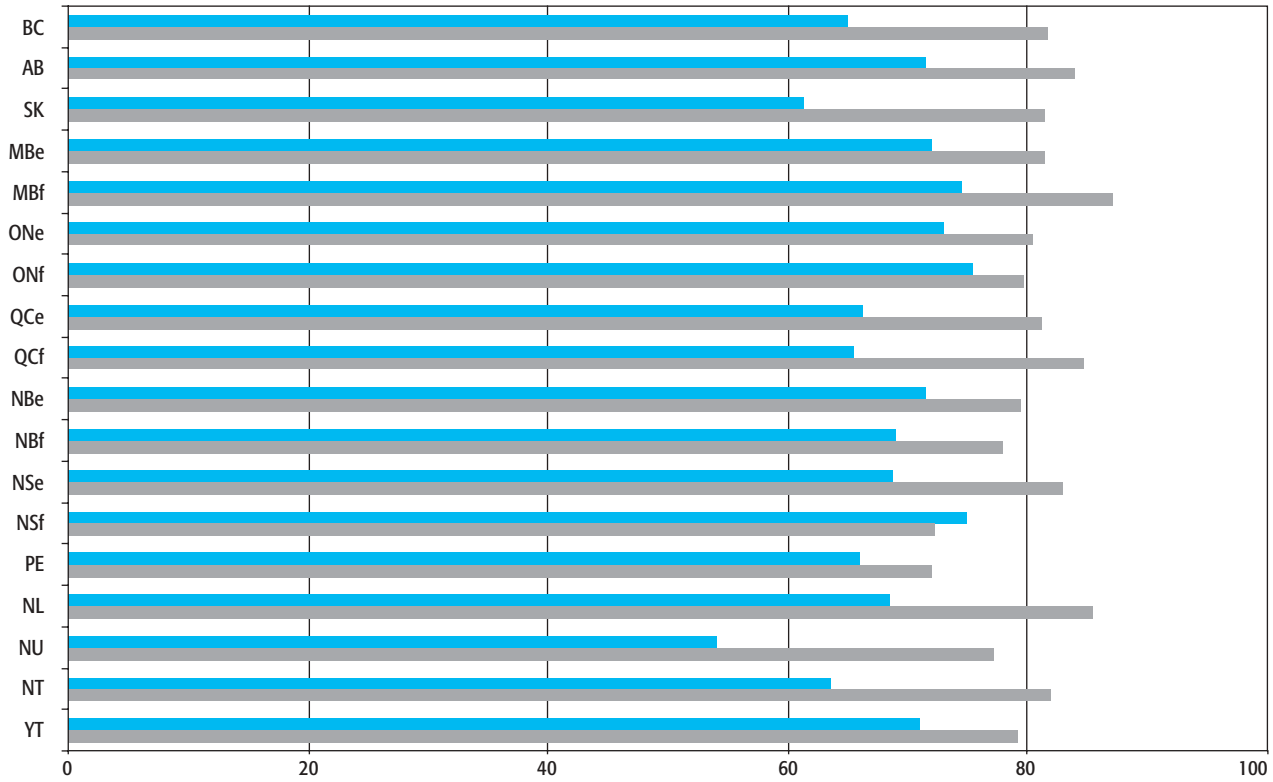
CHART 71



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
This year	26	29	32	32	35	22	30	31	27	30	29	34	37	32	24	41	39	30
Previous years	56	56	49	50	51	60	50	52	57	49	48	49	35	39	61	35	44	51

Mean opportunity to learn: This year and previous years combined

CHART 72



	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	65	71	61	72	74	73	75	66	65	71	69	68	75	66	68	54	63	71
16 Years	81	84	81	81	87	80	79	81	84	79	78	83	72	72	85	77	82	79

STUDENT PERCEPTIONS

The student questionnaire contained 26 questions about student home backgrounds, educational and career aspirations, perceptions of school and mathematics, out-of-school activities, attributions for success and failure, and classroom practices. Students were also asked questions about classroom practices and resources similar to those asked of teachers.

In most cases, the charts in this section contain separate breakdowns for the two age groups. In a few cases, where there were no significant age differences, the two age groups have been combined.

Student Background

Charts 73 through **77** give some data on student backgrounds. **Chart 73** shows a distinct pattern of higher proportions of students born outside Canada being found in Ontario, Quebec, Alberta, and British Columbia. The Eastern provinces and the territories as well as Saskatchewan and Manitoba francophone have relatively few students in this category.

The data on language spoken in the home, as shown in **Chart 74,** present a somewhat different pattern. The language gap between home and school is actually much larger among francophone populations in Manitoba, Ontario, and Nova Scotia, and in Nunavut than in jurisdictions with large immigrant populations.

Percentages of 16-year-olds having parents at the lowest (less than high school completion) and highest (university graduation) levels of education are reported in **Charts 75** and **76**. (Thirteen-year-olds are omitted here because large numbers reported that they did not know their parents' level of education.) In general, more fathers than mothers were reported having less than high school completion. Eastern jurisdictions tended to have higher proportions in this category than Western jurisdictions. The picture is more mixed for university graduation. While significant jurisdictional differences are apparent, there is no obvious regional or language pattern in these differences.

Several questions were asked about possessions in the home that might be related to school work. The percentage of students reporting having a dictionary, encyclopedia, calculator and study desk were uniformly high. **Chart 77** shows the percentage having computers and Internet connection at home. Computers are in more than 80% of homes in all jurisdictions except New Brunswick French, Newfoundland and Labrador, and Nunavut. The figures for Internet connections are slightly lower and more variable, but follow the same general pattern.

Educational and Career Aspirations

Students almost universally have high educational aspirations. More than 90% of all students in all jurisdictions except Nunavut indicated that they intend to continue education beyond high school. The figure for Nunavut was only slightly lower at 82%. By far the most common destination indicated by 16-year-olds was university or college education, with trades/technology education far behind, as shown in **Chart 78**. Although there is some variation across jurisdictions, this is insufficient to override the generally overwhelming preference for university/college education. One possibility here is that the term "college" means something different from "university" in many jurisdictions; if these were separated, the pattern might be different.

Students were asked more specifically to indicate whether they intend to pursue careers requiring education in mathematics. **Chart 79** shows that more than 50% of 16-year-olds reported that they were inclined in that direction. (Again, 13-year-olds have been omitted because of the large proportion of "don't know" responses.) The overall proportions are fairly uniform across jurisdictions.

As for specific mathematics-related fields of work, the most commonly chosen by 16-year-olds were accounting or business and health sciences or technology, at 17% and 16% respectively. These were closely followed by engineering, computer science or technology, and sciences at 14%, 12%, and 10%. Mathematics or science teaching was chosen by less than 2% of 16-year-olds. Variations across jurisdictions were generally small.

Importance of Doing Well in School and in Mathematics

Students were asked if they felt that their parents, friends, teachers, and themselves thought it very important, important, unimportant, or very unimportant that they do well in school. Generally high proportions (in the 75% range) reported that parents think it is very important for them to do well in school. Thirteen-year-olds were slightly more likely to believe this than 16-year-olds. Ratings for friends' perceptions were much lower, with less than 15% of students indicating that their friends think it is very important that they do well. The results for teachers are presented in **Chart 80**. Overall ratings for teachers are lower than for parents. More 13-year-olds than 16-year-olds in all

jurisdictions felt that their teachers think it is very important for them to do well. As for their own views of the importance of doing well, **Chart 81** shows moderately high ratings, with some variations across jurisdictions. Age differences show 13-year-olds with more positive perceptions than 16-year-olds in most jurisdictions, with the exception of Newfoundland and Labrador and the territories where the differences are quite small.

Student perceptions of belief by parents, mathematics teachers, and themselves in the importance of their doing well in mathematics are presented in **Charts 82** through **84**. For parents and students themselves, the perceived importance of doing well in mathematics is generally much lower than for doing well in school. Student perceptions of how mathematics teachers view the importance of their doing well in mathematics are roughly comparable to those for all teachers. In all of these cases, the age difference is pronounced, with 13-year-olds expressing more positive perceptions than 16-year-olds. Jurisdictional differences are more pronounced for students' perceptions of the importance of doing well in mathematics than for doing well in school generally.

Perceptions of Mathematics as a School Subject

There was almost universal agreement with the proposition that mathematics is an important school subject. As **Chart 85** shows, the proportions agreeing that mathematics is important for their own future studies are also high, though less so for 16-year-olds than for 13-year-olds.

Students were asked if they believe that mathematics is more difficult than other school subjects. The results are shown in **Chart 86**. Generally speaking, about half the students agreed with this proposition, with 16-year-olds more likely to agree than 13-year-olds. There was a high correlation between responses to the difficulty statement and the statement "I am not very interested in mathematics," indicating that the same students who find mathematics difficult tend also to be less interested. There is some tendency toward language differences on the difficulty statement, with francophone students being less likely to agree with the statement than anglophone students.

Motivation and Attributions

Questions in this cluster had to do with whom students would turn to for help with difficult problems in mathematics, and their attributions of success or failure.

Altogether, more than 90% of students throughout agreed that they would ask their teachers for help with difficult mathematics problems. The figures were also uniformly high, at about 75% for asking friends. As for parents, as **Chart 87** shows, age differences are quite pronounced, with many more 13- than 16-year-olds agreeing that they would ask their parents.

A measure of internal motivation is the degree to which students would persist in working at a difficult problem. The percentage of students agreeing with the proposition that they would keep trying a difficult problem until it is solved is given in **Chart 88**. These figures are generally quite high, with few age or jurisdiction differences.

Almost all students agreed that to do well in mathematics you need hard work and good teaching. Only slightly lower percentage agreed that encouragement from parents and teachers is required. The percentage of students reporting that natural ability is needed to do well in mathematics is presented in **Chart 89**. It is interesting to note that students generally express stronger belief in natural ability than their teachers (**Chart 68**). Also, the language differences apparent for teachers are not reflected in student responses. However, there is a substantial age difference in this case, with 16-year-olds expressing stronger belief in natural ability than 13-year-olds.

Finally, **Chart 90** shows that relatively few students overall believe that good luck is needed to do well in mathematics. However, there are large jurisdictional differences here, with Manitoba and Nova Scotia francophone students and students in Nunavut more likely to feel that luck is required.

More specifically, students were asked about the part played by study, teacher marking, luck, course difficulty and quality of teaching as factors affecting either unusually high or low marks in mathematics courses. Rather than presenting a long series of related charts, the response patterns may be summarized as follows:

1. There was strong agreement throughout that low marks can be attributed to not working hard enough and high marks to working especially hard.
2. Almost all students agreed that high marks are due to the course being well taught, but only about half attributed poor marks to poor teaching. Age differences were evident in the latter, with more 16-year-olds than 13-year-olds attributing low marks to poor teaching.
3. Only a small percentage of students attributed their low or high marks to the teacher's marking either too hard or too easy.
4. More students tended to attribute low marks to difficult courses than high marks to easy courses.
5. As before, there were jurisdictional differences in perceptions of the part played by luck in the marks received. Overall percentage agreeing with statements about luck were in the 20% range. However, francophone students outside Quebec and Nunavut students were somewhat more likely to attribute marks, either high or low, to luck.

As the final question in this section, students were asked how satisfied they are with their mathematics marks. The percentage of satisfied and very satisfied students appears in **Chart 91**. An age difference is apparent here, with 13-year-olds being more satisfied than 16-year-olds. This follows the pattern of actual reported marks, as shown in **Chart 92**, with 13-year-olds generally reporting receiving higher marks than 16-year-olds. There seems to be a slight tendency for marks to be lower in British Columbia, Alberta, and the territories than elsewhere. Across jurisdictions, satisfaction is also highly correlated with actual reported marks.

Tutoring, Homework, and Computer Activities

Chart 93 shows that about 20% of students reported having some tutoring or other out-of-school instruction in mathematics. About half of these reported spending one hour or more per week on these activities.

Chart 94 shows that about half the students spend one hour or more per week on mathematics homework, with the highest levels at both ages in Newfoundland and Labrador and the lowest in Nunavut.

The levels of computer use in school and other work are reported in **Charts 95** to **97.**

Relatively few students use the computer for mathematics homework, with slight differences favouring 13-year-olds in most jurisdictions. Computer use for other school work is more extensive, as **Chart 96** shows. More students in the Western provinces and Ontario than elsewhere tend to report computer use for school work.

Computer use for school work may be contrasted with use for entertainment. Close to 90% of students reported at least some use of the computer for entertainment, although this number was much lower for Nunavut than elsewhere. The percentages reporting 3 hours or more of computer entertainment are shown in **Chart 97**. There is a slight tendency toward lower levels of use in Nunavut and the Northwest Territories and among New Brunswick francophone students than in other jurisdictions.

Quality of School Life

Students were asked to respond to a 15-item agree-disagree scale, containing a series of propositions about the quality of their school life. Generally, the responses showed a pattern of highly positive feelings about school. More than 90% of students agreed that they have a lot of friends in school, that they get along with other students, and that they like to learn new things. Generally more than 80% reported that people in the school respect them and that teachers treat them fairly and give them the marks they deserve. However, some other items showed less positive feelings and more mixed results across jurisdictions. Some of these items are therefore looked at in more detail in **Charts 98** to **101**.

Chart 98 shows that about 70% of students overall reported that they feel good about school. Nunavut students were most positive and Nova Scotia francophone students least positive on this question. A closely parallel question about enjoyment of school (**Chart 99**) yielded somewhat less positive and slightly more variable responses, with the same pattern being evident for Nunavut and Nova Scotia francophone students.

As **Charts 100** and **101** indicate, fewer students agreed with the negative statements "There is not much interesting to do in school" and "I am bossed around too much in school" than with the more positive statements. However, language differences are quite pronounced on these statements. Fewer francophone than anglophone students agreed that there is not much interesting to do. There were even larger language differences on the second statement, with far more francophone students feeling that they are bossed around too much.

Quality of school life may be expected to be related to student absenteeism. **Chart 102** shows the percentage of students who reported being absent for six or more days this year. There is a tendency for absenteeism to be highest in the territories and lowest among Quebec francophone, New Brunswick francophone, and Nova Scotia francophone students. Interestingly, the highest rate of absence is in Nunavut, where students also reported the highest level of feeling good about school. However, lest this be interpreted as meaning that students enjoy school more when they are absent, it is stressed that the correlations between absenteeism and feelings about quality of school life are in the expected direction, with higher absenteeism being associated with a lower rating on quality of school life items.

Interaction with Parents on School Work

Students were asked how often they work with their parents on mathematics and other homework and how often they discuss various matters with their parents. Overall, more than 80% of students reported that they frequently discuss their school work with parents, with few language or age differences

Results for mathematics homework are reported in **Chart 103**. Here the age differences are obvious, with 13-year-olds much more often reporting working with parents on mathematics homework a few times a month or more. Small language differences, with francophone students reporting less homework time with parents, are apparent for 13-year-olds but not for 16-year-olds.

The results for discussing their future with parents appear in **Chart 104**. Here the percentages are quite high, with 16-year-olds doing this more often than 13-year-olds.

Classroom Activities and Resource Use

The questions asked of students about classroom activities were closely parallel to those asked of teachers. Generally speaking, student responses appear to be consistent with those of teachers. However, a more detailed comparison is needed before this can be used as an indicator of the reliability of these types of reports. Teacher responses were summarized briefly in the teacher section. A somewhat more detailed account is given here because it is possible to highlight age and language differences.

Chart 105 gives the percentage of students reporting that their teachers give notes a few times a week or more. The prevalence of this activity varies widely by jurisdiction, age, and language. In most jurisdictions, note-giving is more prevalent at 16 years than at 13 years. Generally, speaking, note-giving is less prevalent and varies less by age in francophone jurisdictions.

The prevalence of workbook or worksheet activity is shown in **Chart 106**. This activity is much more prevalent and less variable than note-giving, and occurs more often in classes of 13-year-olds than of 16-year-olds.

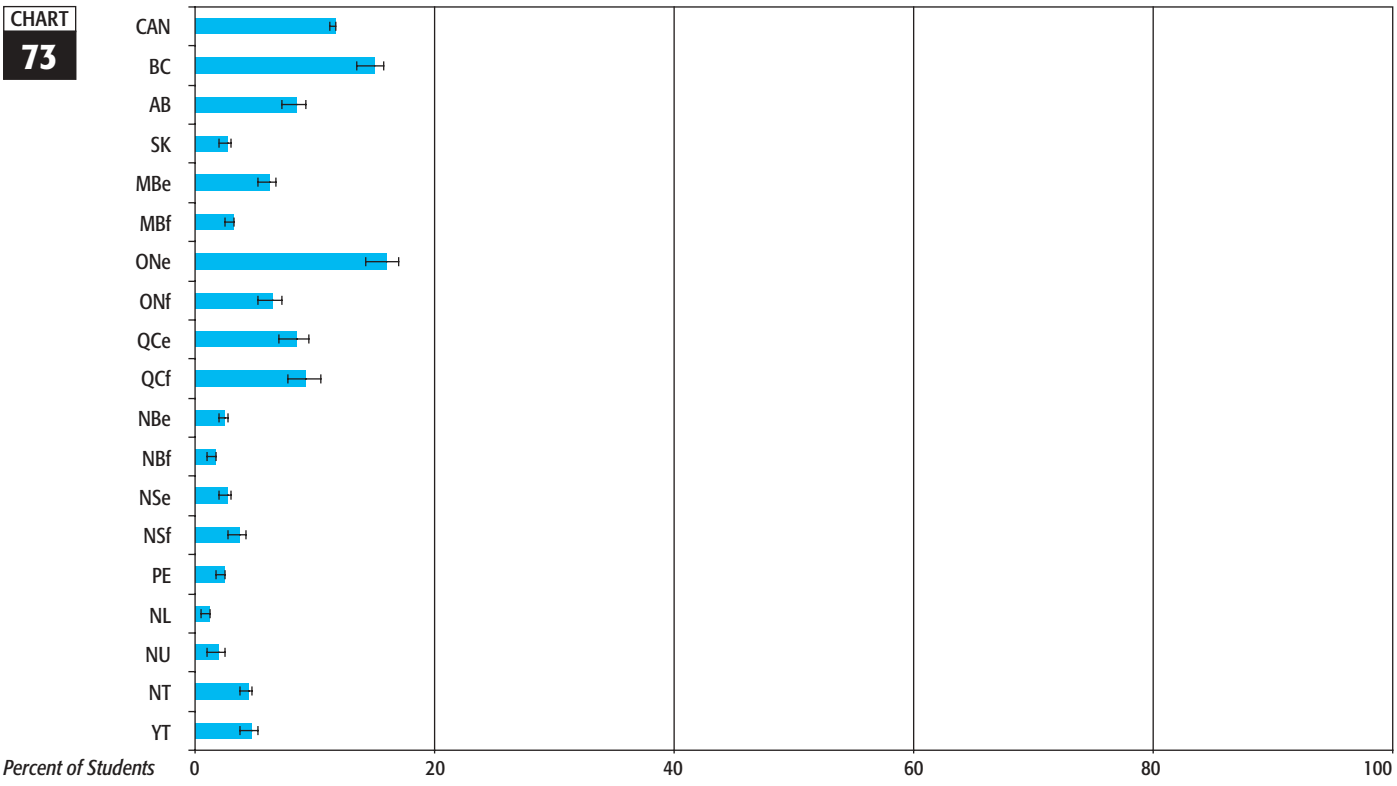
Charts 107 and **108** examine the frequency of students working alone and in pairs or small groups. Working alone is a highly prevalent activity in all jurisdictions, with Nova Scotia francophone students being somewhat lower than others. Small-group work is less prevalent and more variable. Nova Scotia francophone students again stand out, indicating a trade-off between individual and group work.

As **Chart 109** indicates, it is common for teachers to help individual students with their work. There is a tendency for this activity to be less prevalent in francophone than in anglophone classes.

Results for a selection of the items on resource use are presented in **Charts 110, 111,** and **112**. The pattern for mathematics books and magazines shows strong language differences, as was the case for teacher responses to the same item. Use of graphing calculators varies widely by age, with much more frequent use in classes of 16-year-olds. However, it should be noted that the question on graphing calculators did not distinguish between their general use as calculators and their use for graphing. Finally, the use of measuring devices is more prevalent in classes of 13-year-olds and in francophone classes than in others. Other resource use patterns were similar to those found for teachers.

Percentage of students born outside of Canada

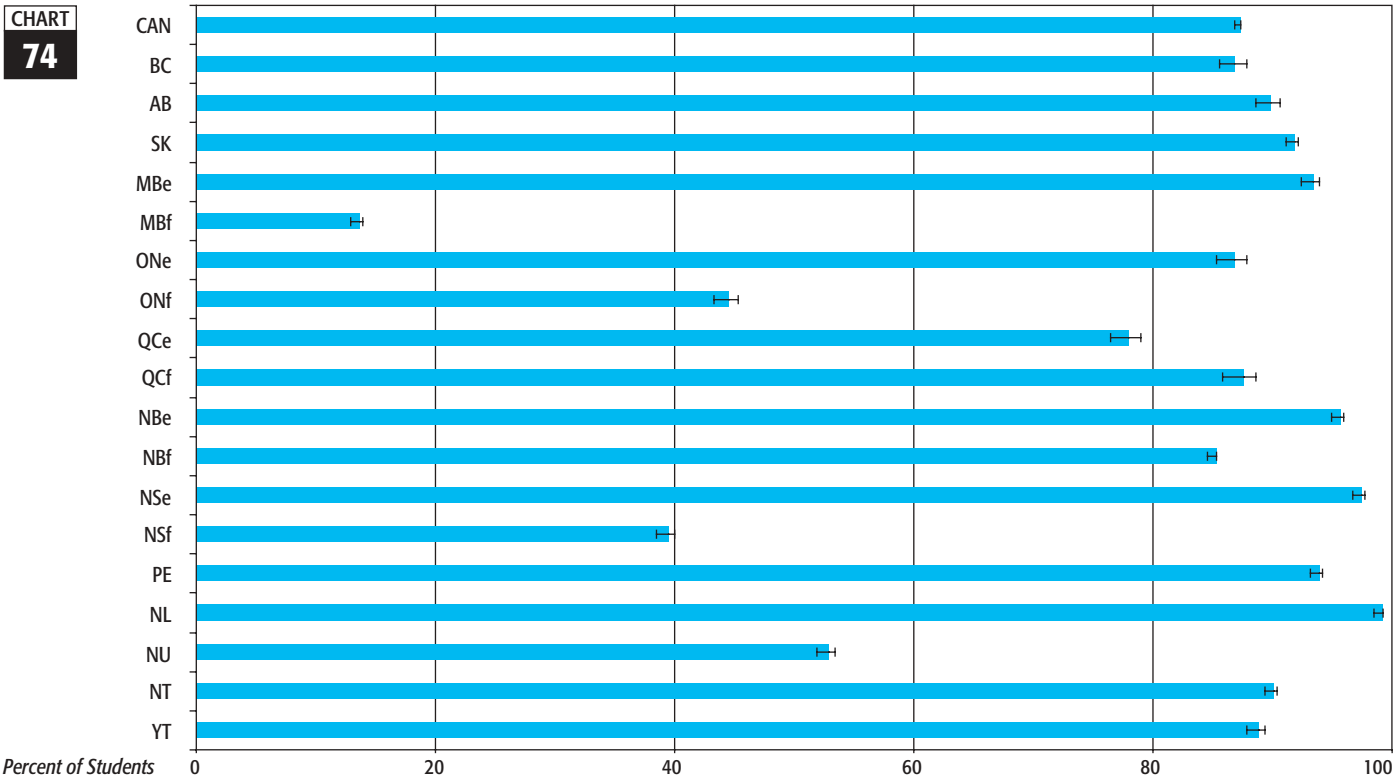
CHART 73



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	11	15	8	2	6	3	16	6	8	9	2	1	2	4	2	1	2	4	4

Percentage of students always or nearly always speaking the language of the test at home

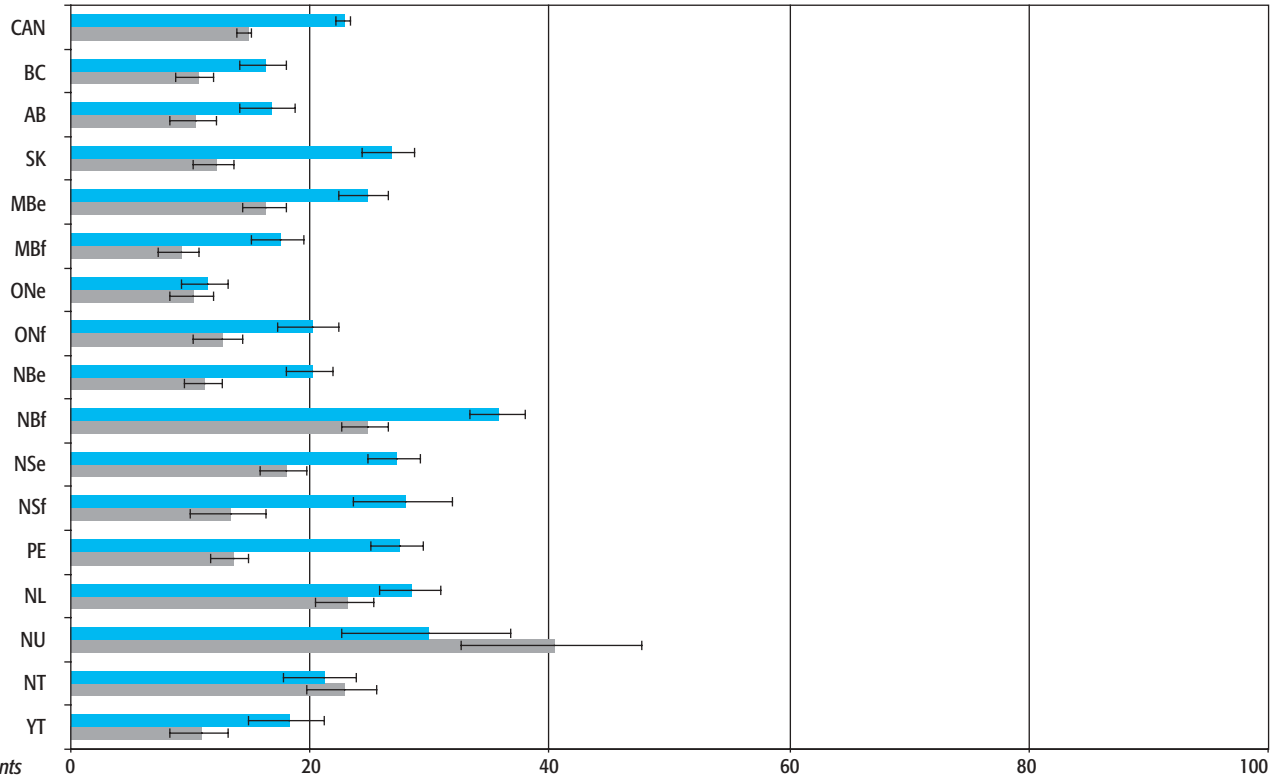
CHART 74



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
%	87	87	90	92	93	13	87	44	78	87	95	85	97	39	94	99	53	90	89

Percentage of parents of 16-year-olds with less than high school education

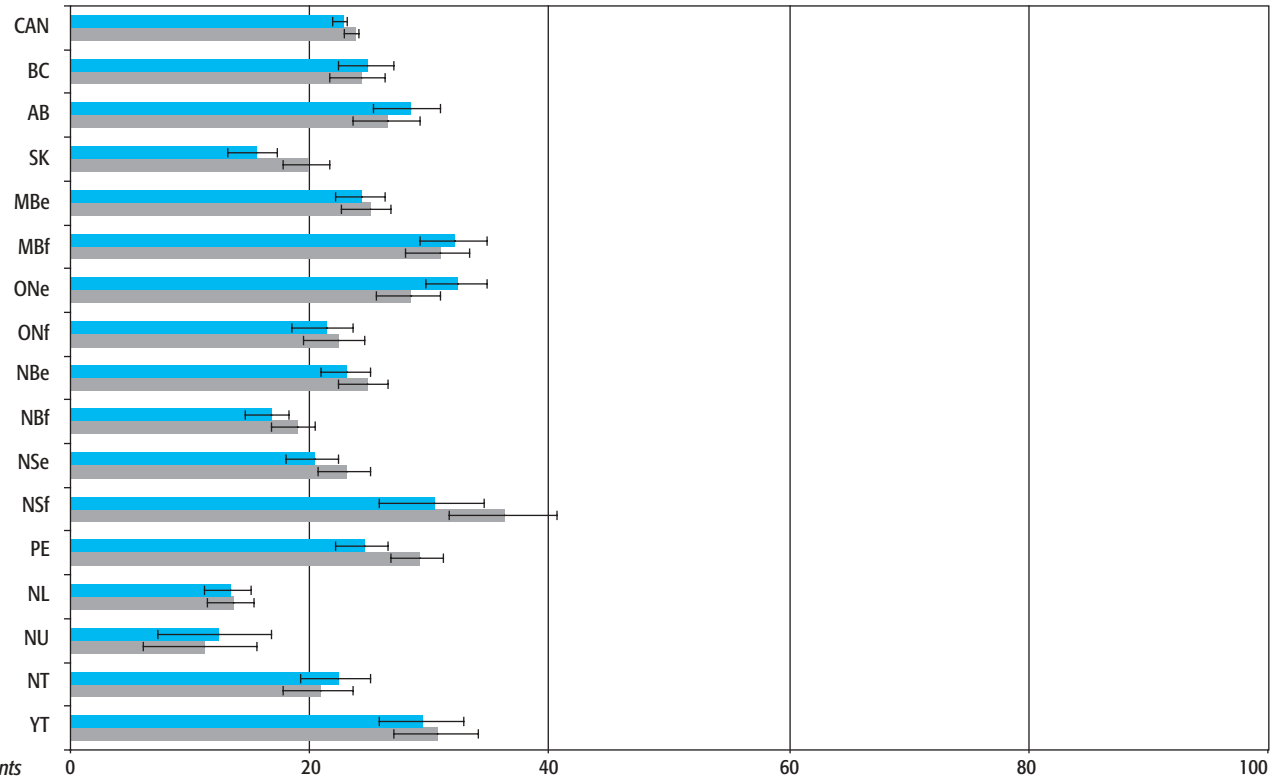
CHART 75



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Father	23	16	16	27	24	17	11	20	20	36	27	28	27	28	30	21	18
Mother	15	10	10	12	16	9	10	12	11	25	18	13	13	23	40	23	11

Percentage of parents of 16-year-olds with university degrees

CHART 76



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Father	23	25	28	15	24	32	32	21	23	17	20	30	24	13	12	22	29
Mother	23	24	26	20	25	31	28	22	25	19	23	36	29	13	11	21	31

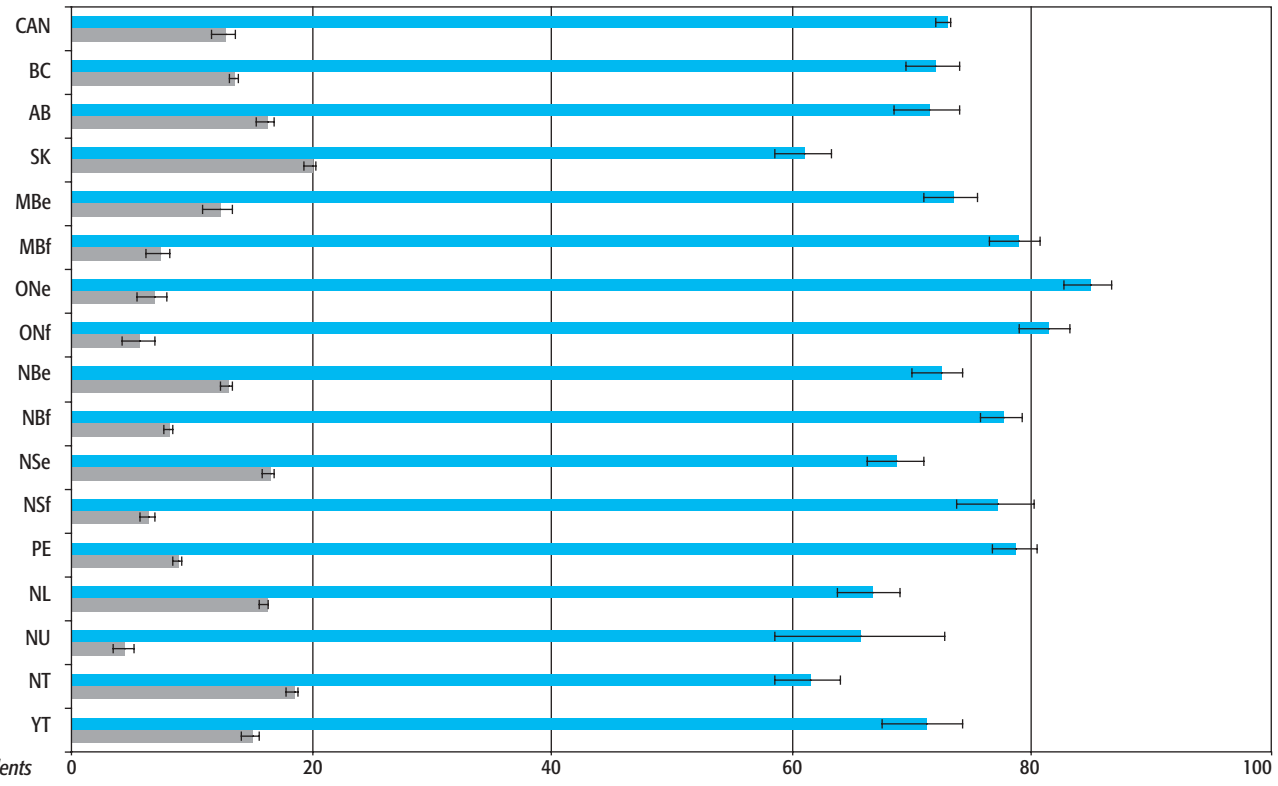
Percentage of students having computer and Internet connection at home

CHART 77

	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Computer	88	93	92	91	88	94	95	93	93	88	86	76	85	93	85	77	52	82	88
Internet	76	83	80	73	73	82	87	83	86	80	77	61	74	87	72	60	32	71	76

Percentage of 16-year-olds planning to attend university/college or trades/technology education

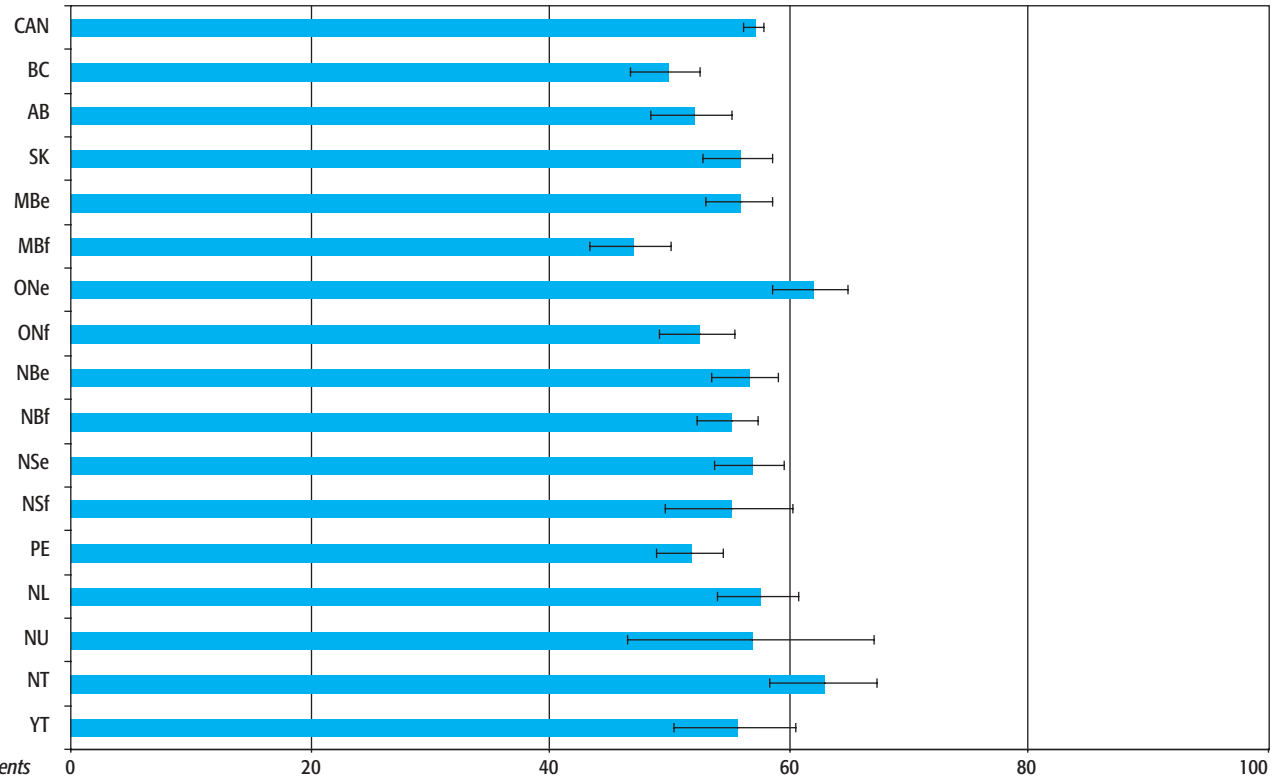
CHART 78



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Univ/College	73	72	71	61	73	79	85	81	72	77	69	77	78	66	66	61	71
Trade/Tech	13	14	16	20	12	7	7	6	13	8	16	6	9	16	4	18	15

Percentage of 16-year-olds planning to work in a field requiring education in mathematics

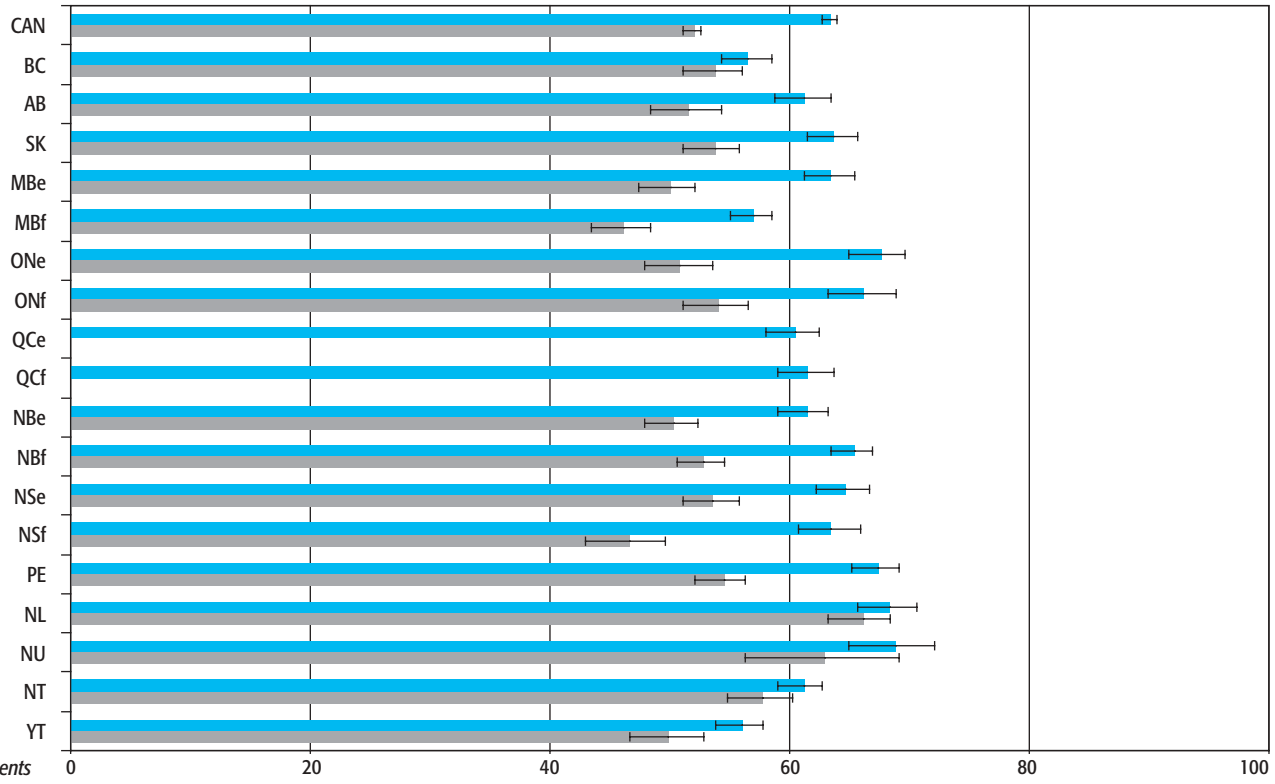
CHART 79



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
% Yes	57	50	52	56	56	47	62	52	56	55	57	55	52	57	57	63	55

Percentage of students reporting that teachers think it is very important for them to do well in school

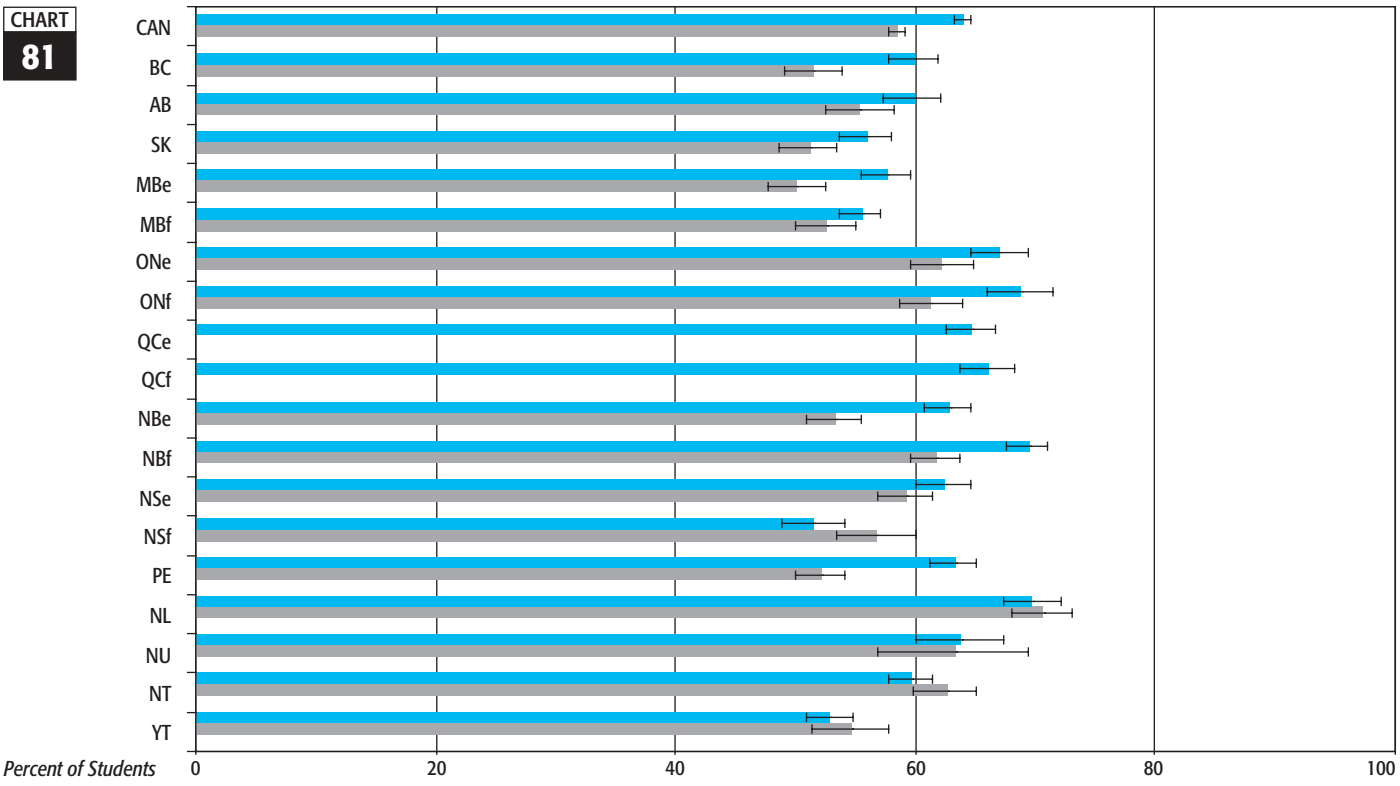
CHART 80



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	63	56	61	64	63	57	67	66	60	61	61	65	64	63	67	68	69	61	56
16 Years	52	54	51	54	50	46	51	54	–	–	50	53	53	46	54	66	63	58	50

Percentage of students reporting that they believe it is very important for them to do well in school

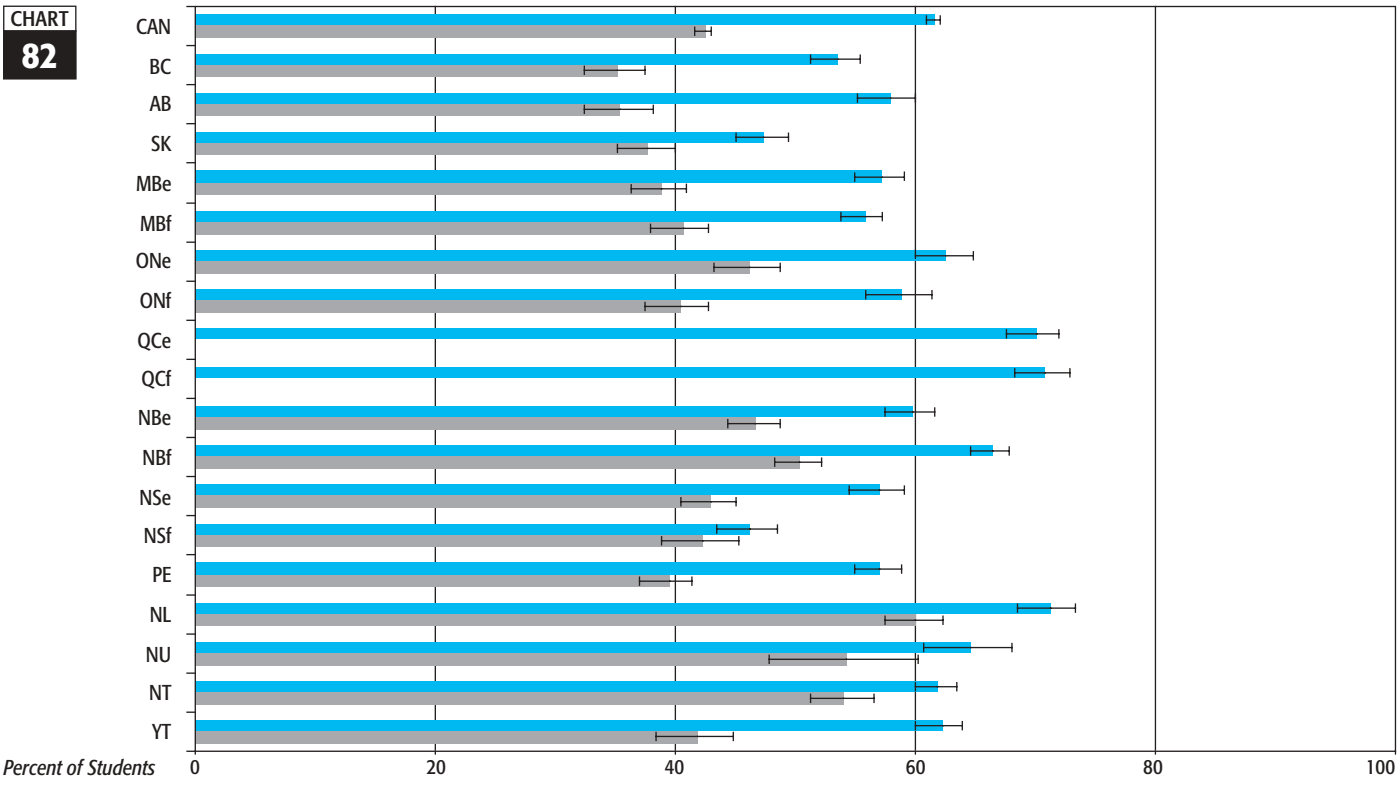
CHART 81



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	64	60	60	56	57	55	67	69	65	66	63	69	62	51	63	70	64	59	53
16 Years	58	51	55	51	50	52	62	61	–	–	53	62	59	57	52	71	63	63	55

Percentage of students reporting that parents think it is very important for them to do well in mathematics

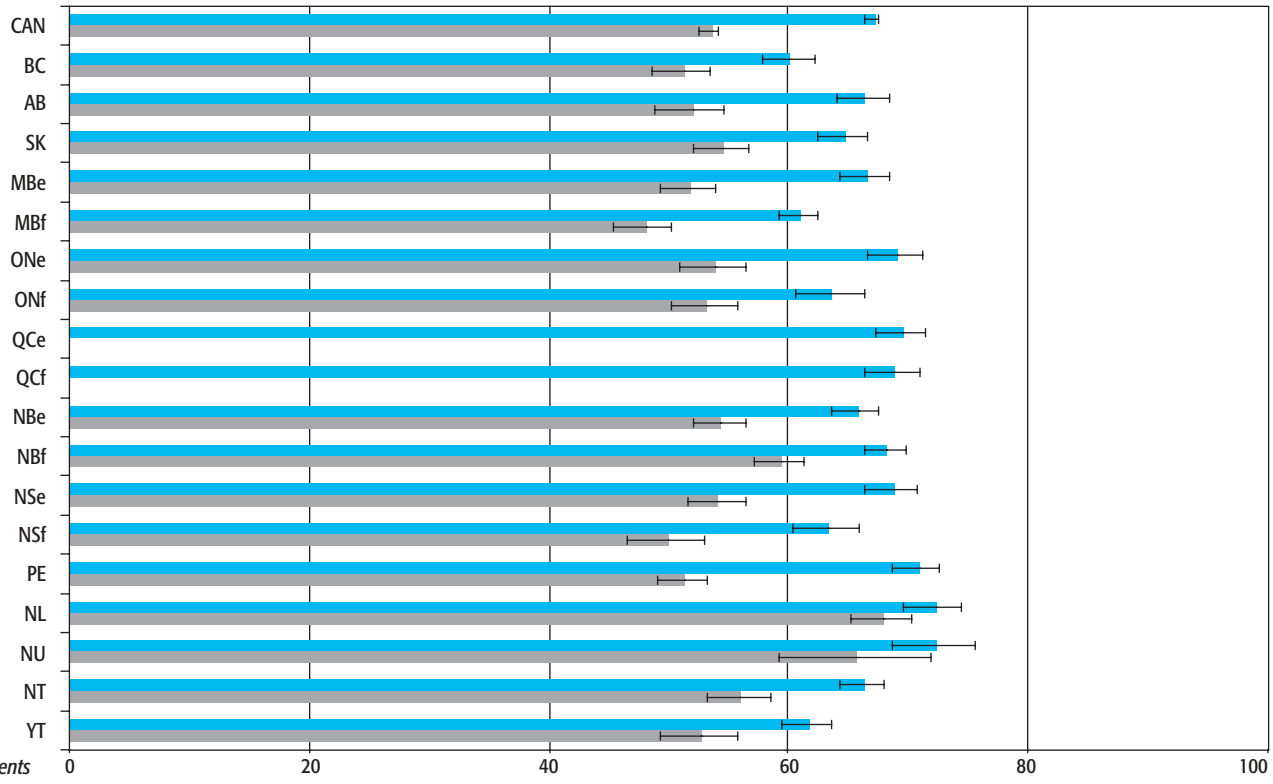
CHART 82



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	61	53	58	47	57	56	62	59	70	71	60	66	57	46	57	71	64	62	62
16 Years	42	35	35	38	39	40	46	40	–	–	46	50	43	42	39	60	54	54	42

Percentage of students reporting that mathematics teachers think it is very important for them to do well in mathematics

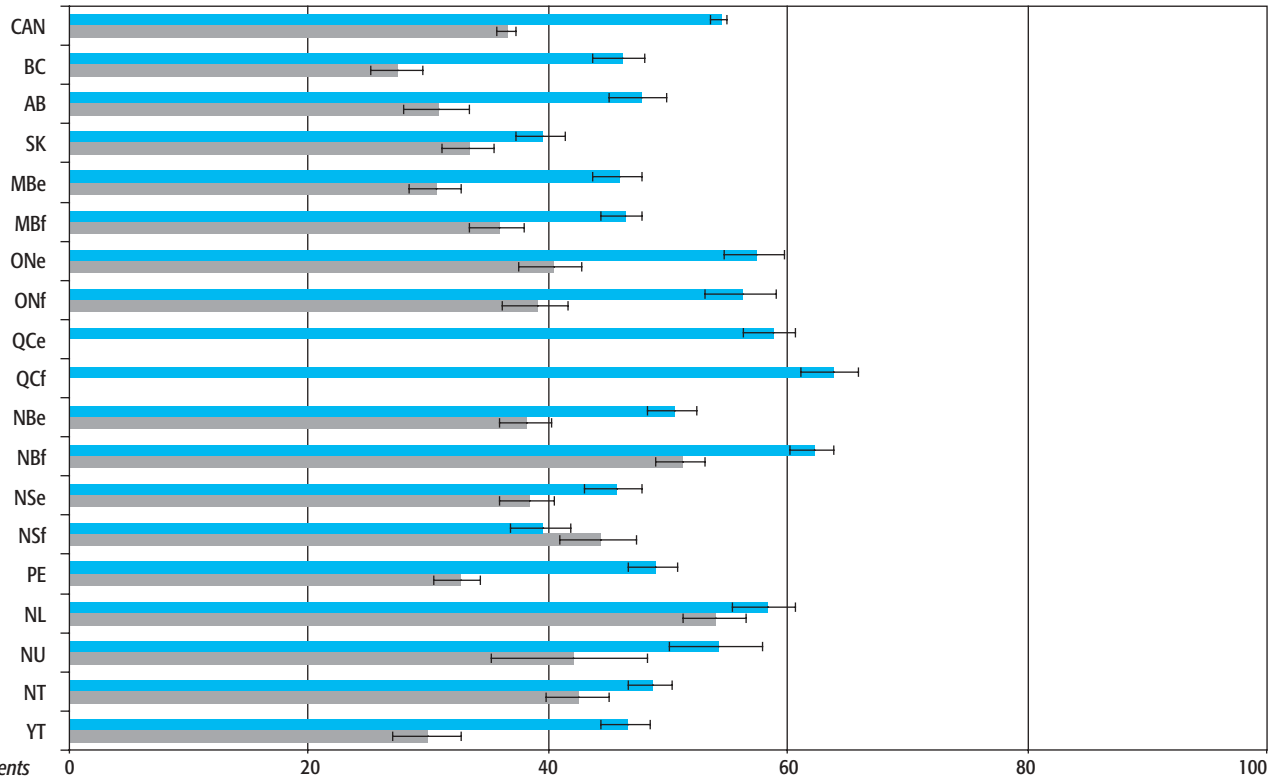
CHART 83



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	67	60	66	64	66	61	69	63	69	69	66	68	69	63	71	72	72	66	62
16 Years	53	51	52	54	52	48	54	53	–	–	54	59	54	50	51	68	66	56	53

Percentage of students reporting that they believe it is very important for them to do well in mathematics

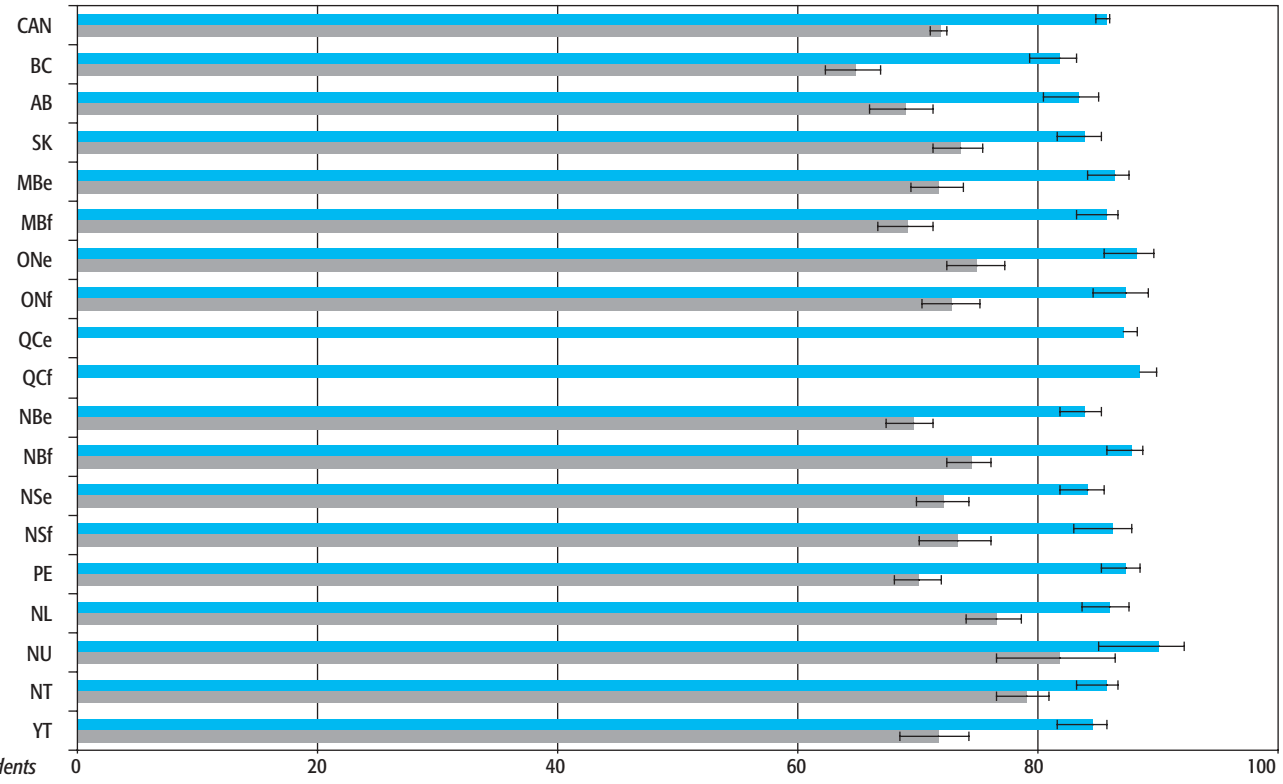
CHART 84



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	54	46	48	39	46	46	57	56	59	64	50	62	45	39	49	58	54	48	46
16 Years	36	27	31	33	31	36	40	39	–	–	38	51	38	44	32	54	42	42	30

Percentage of students agreeing that mathematics is important to their future studies

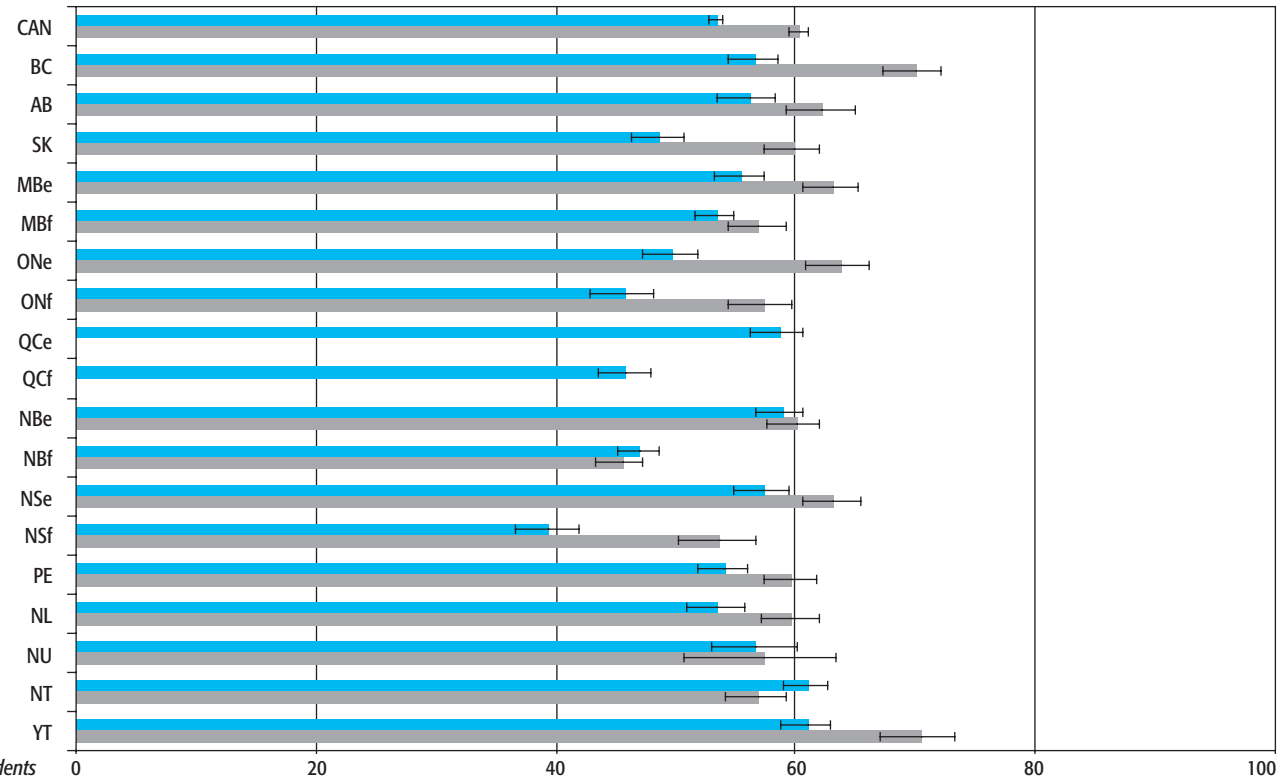
CHART 85



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	85	82	83	84	86	85	88	87	87	88	84	88	84	86	87	86	90	86	84
16 Years	72	65	69	73	72	69	75	73	–	–	69	74	72	73	70	76	82	79	71

Percentage of students agreeing that mathematics is more difficult than other school subjects

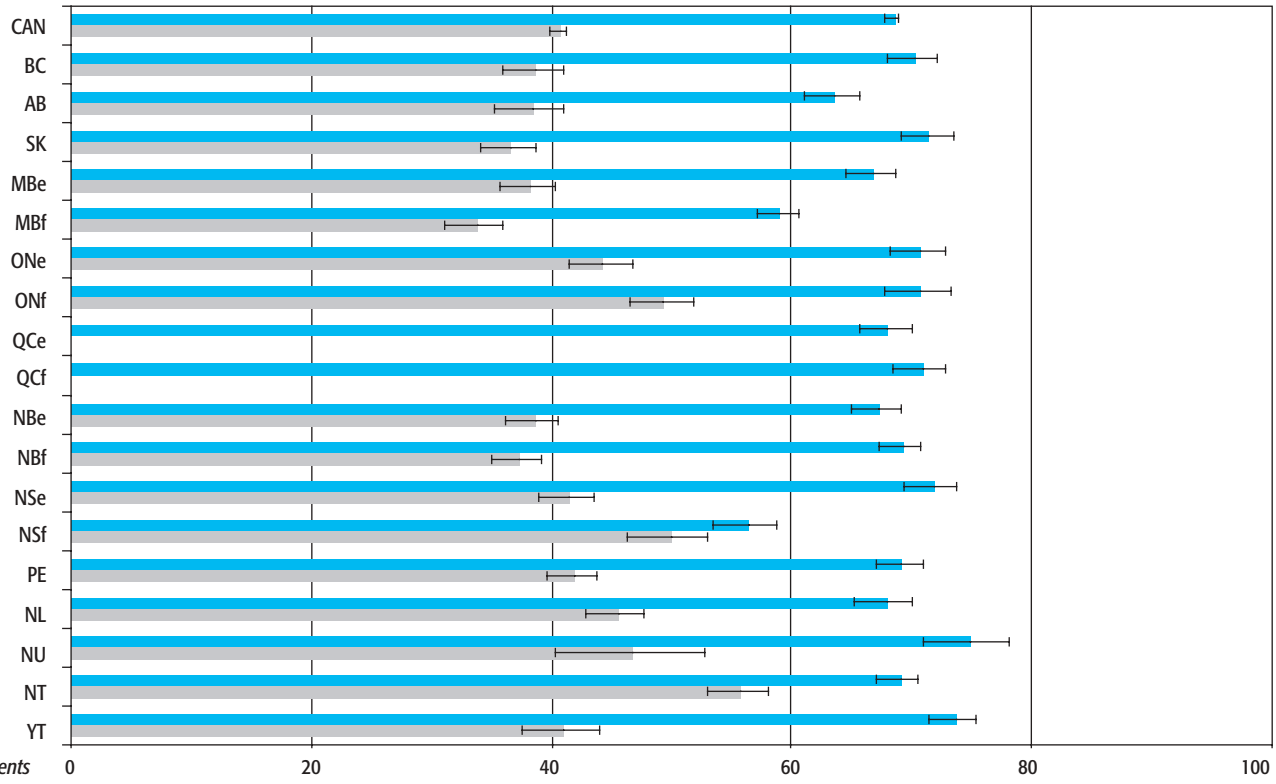
CHART 86



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	53	56	56	48	55	53	49	46	58	46	59	47	57	39	54	53	57	61	61
16 Years	60	70	62	60	63	57	64	57	–	–	60	45	63	53	60	59	57	57	70

Percentage of students who would ask their parents for help with a difficult mathematics problem

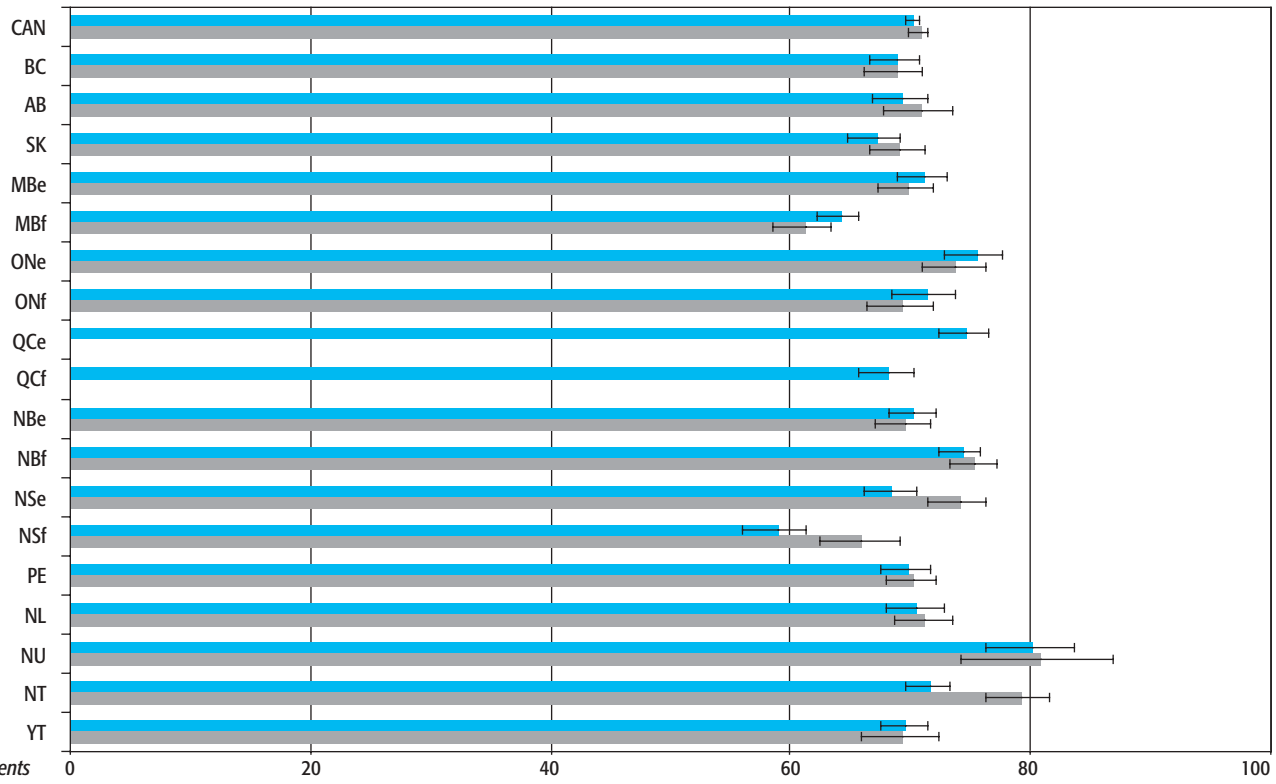
CHART 87



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	68	70	63	71	67	59	71	71	68	71	67	69	72	56	69	68	75	69	73
16 Years	41	38	38	36	38	34	44	49	–	–	38	37	41	50	42	45	47	55	41

Percentage of students who would keep trying a difficult mathematics problem until it is solved

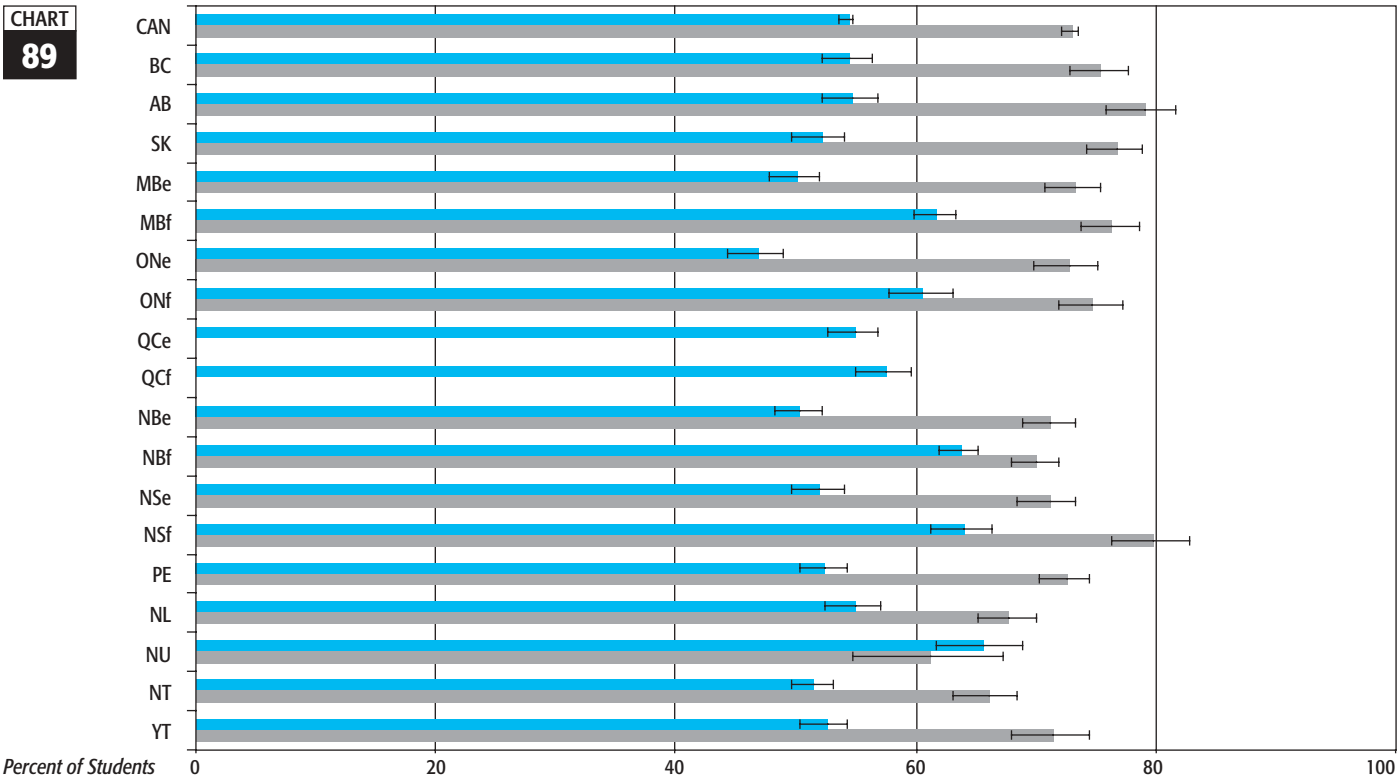
CHART 88



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	70	69	69	67	71	64	75	71	74	68	70	74	68	59	70	70	80	71	69
16 Years	71	69	71	69	70	61	74	69	–	–	69	75	74	66	70	71	81	79	69

Percentage of students agreeing that to do well in mathematics you need natural ability

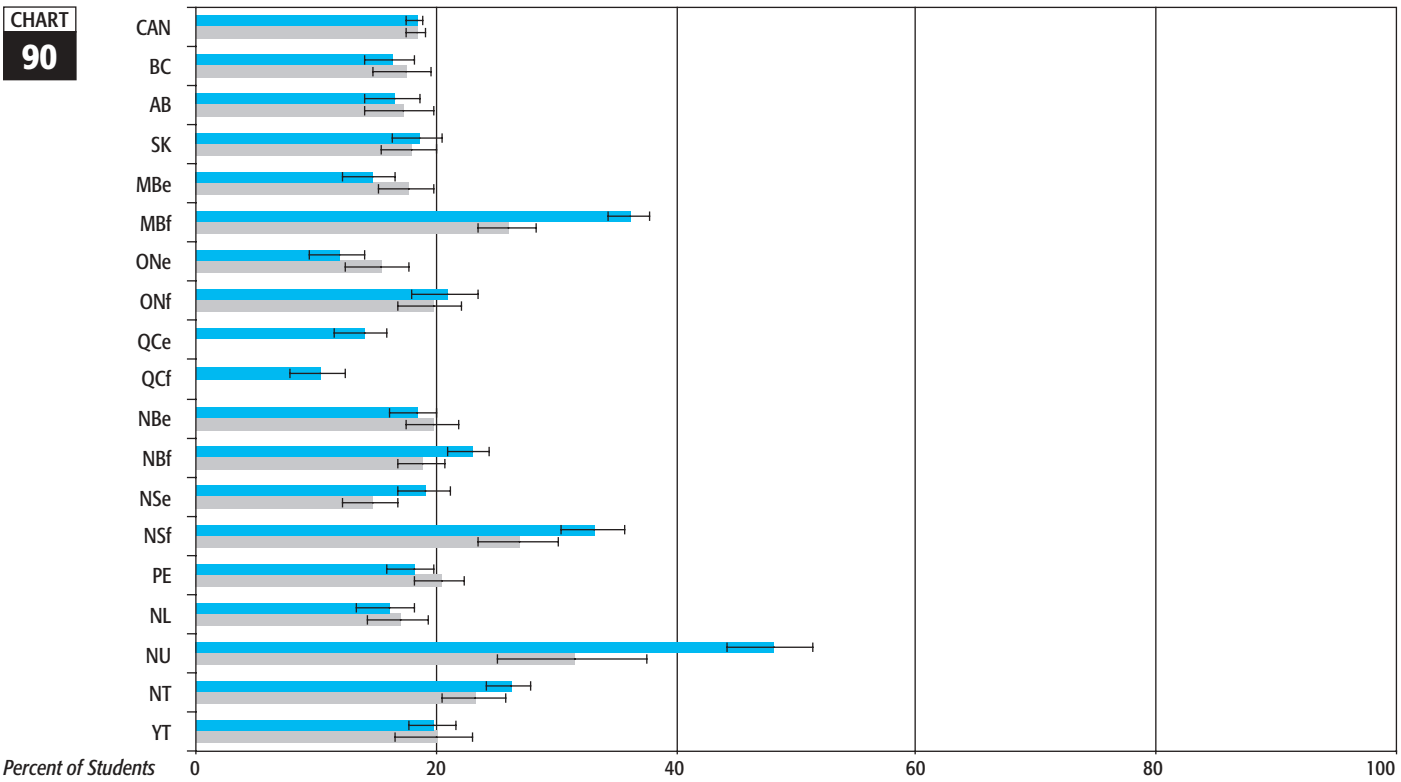
CHART 89



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	54	54	55	52	50	62	47	60	55	57	50	64	52	64	52	55	65	51	52
16 Years	73	75	79	77	73	76	73	74	–	–	71	70	71	80	72	68	61	66	71

Percentage of students agreeing that to do well in mathematics you need good luck

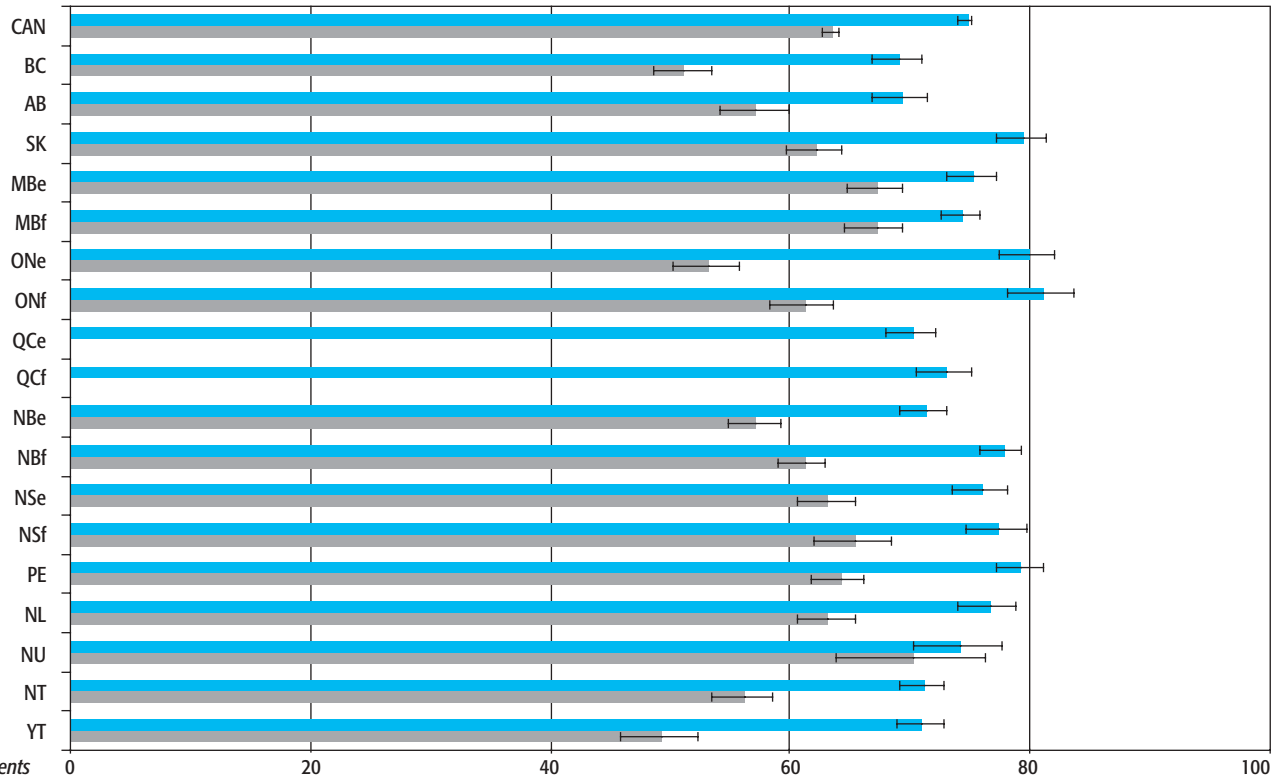
CHART 90



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	18	16	16	18	14	36	12	21	14	10	18	23	19	33	18	16	48	26	20
16 Years	18	17	17	18	17	26	15	20	–	–	20	19	15	27	20	17	31	23	20

Percentage of students satisfied with how well they are doing in mathematics this year

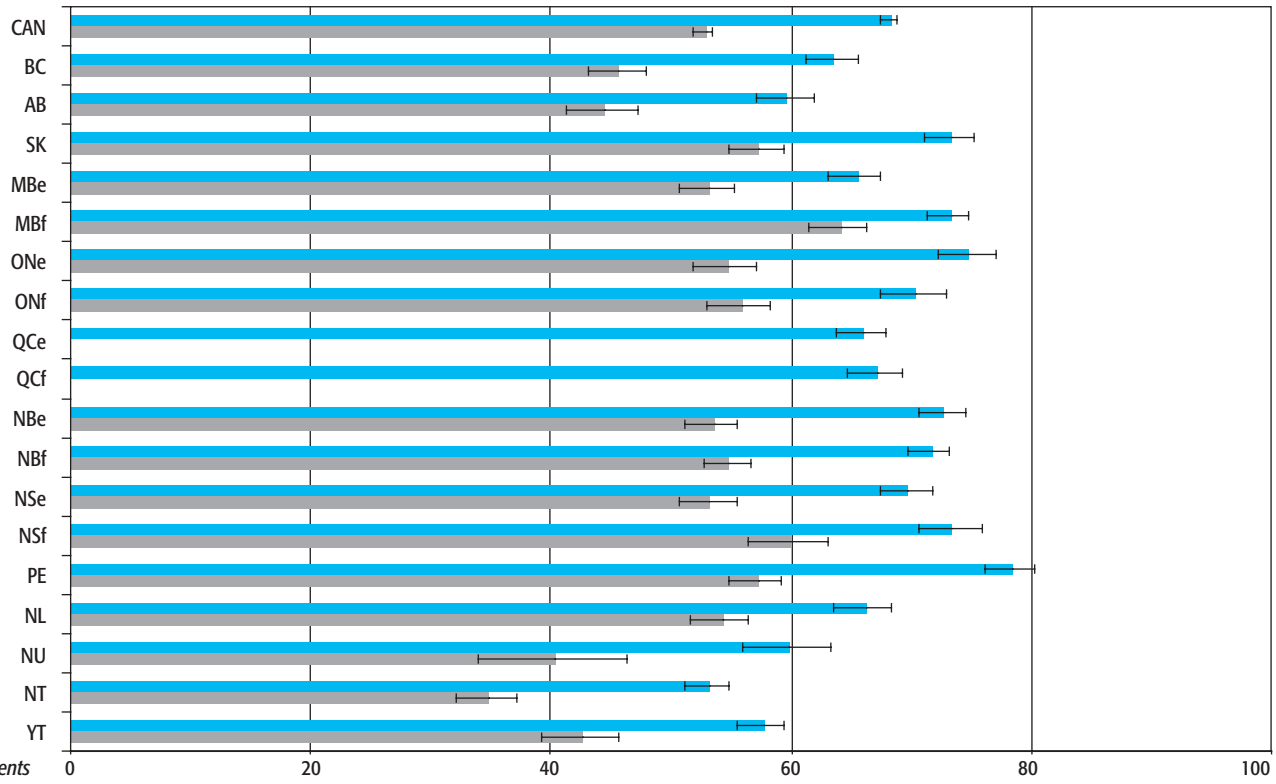
CHART 91



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	75	69	69	79	75	74	80	81	70	73	71	78	76	77	79	76	74	71	71
16 Years	63	51	57	62	67	67	53	61	–	–	57	61	63	65	64	63	70	56	49

Percentage of students with average mathematics mark of 70 or more

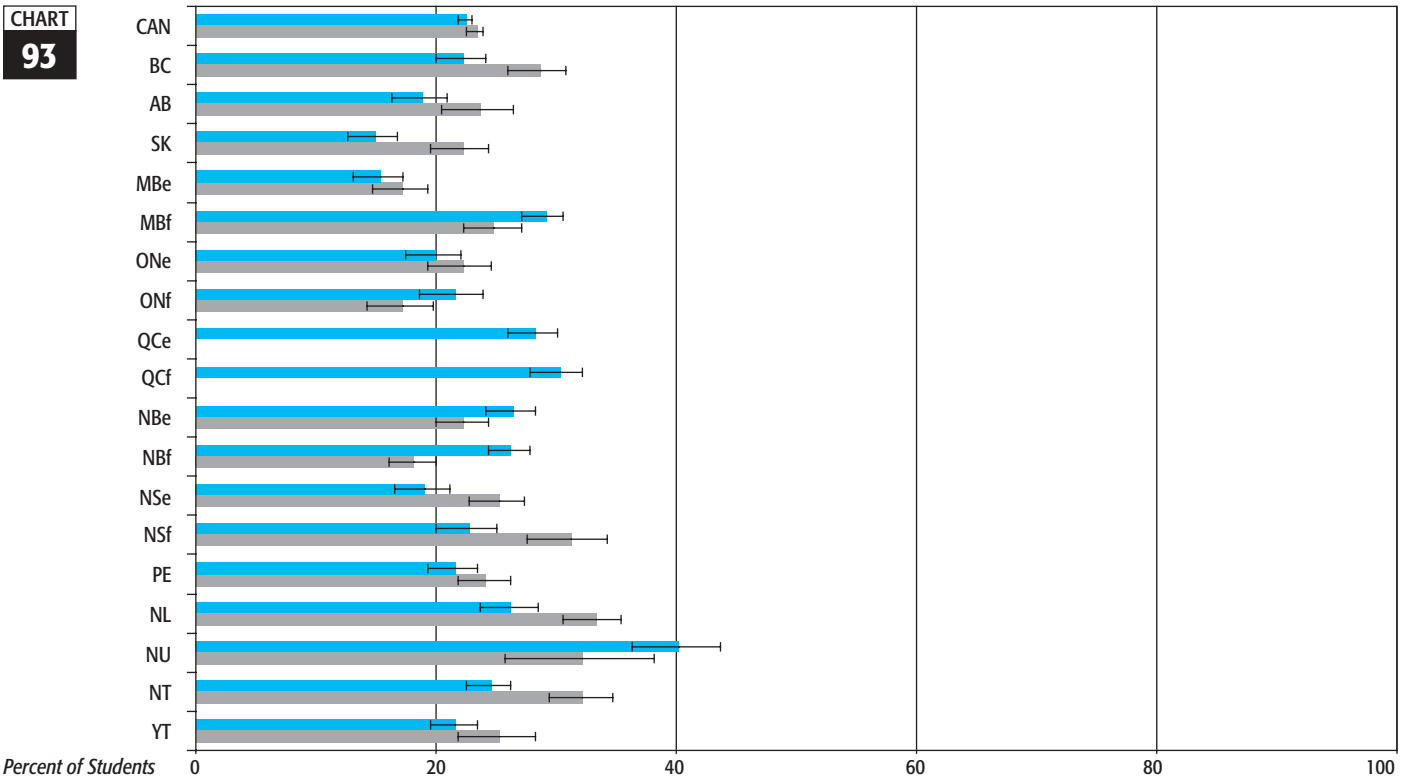
CHART 92



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	68	63	60	73	65	73	75	70	66	67	73	71	70	73	78	66	60	53	57
16 Years	53	45	44	57	53	64	54	56	–	–	53	55	53	60	57	54	40	35	43

Percentage of students reporting any time spent having tutoring or extra lessons in mathematics

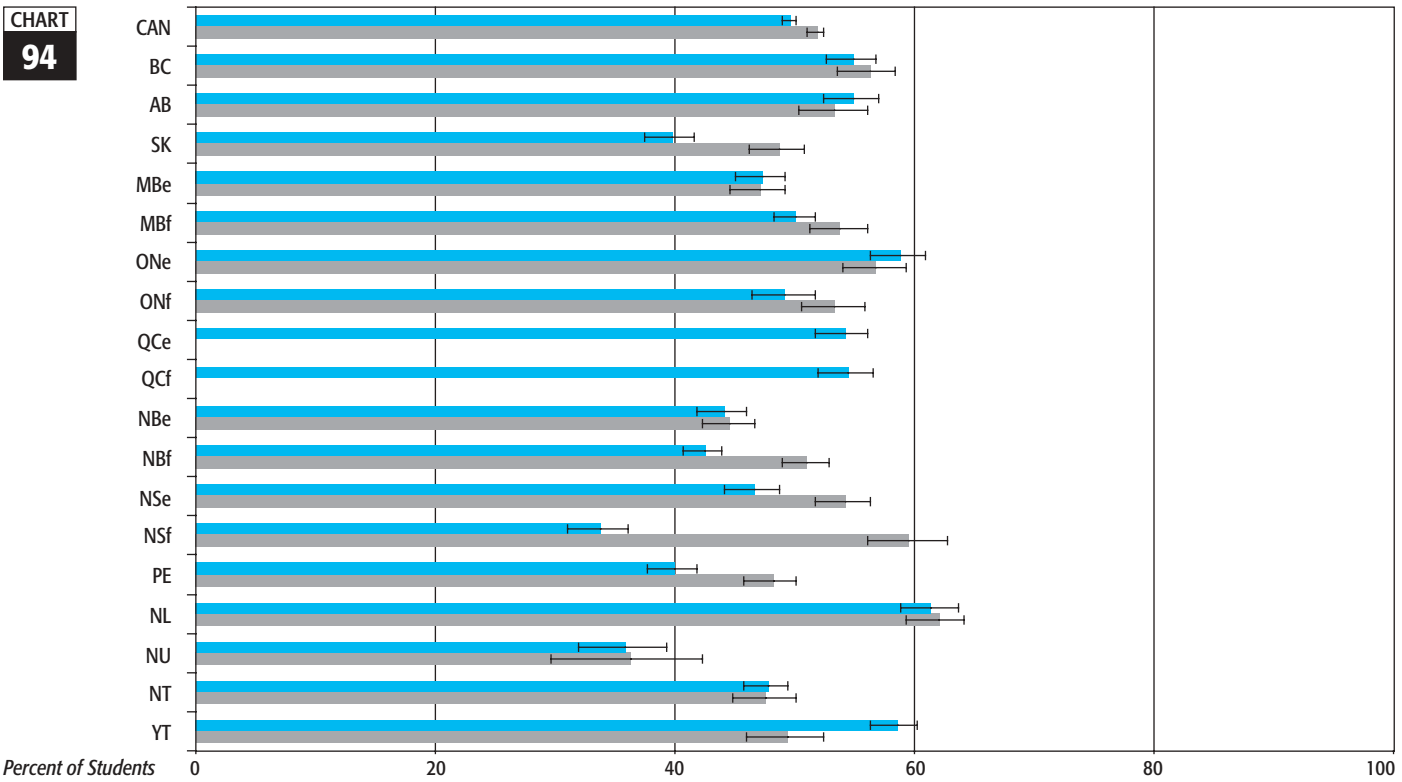
CHART 93



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	22	22	19	15	15	29	20	21	28	30	26	26	19	23	21	26	40	24	21
16 Years	23	28	23	22	17	25	22	17	–	–	22	18	25	31	24	33	32	32	25

Percentage of students spending one hour or more per week doing mathematics homework

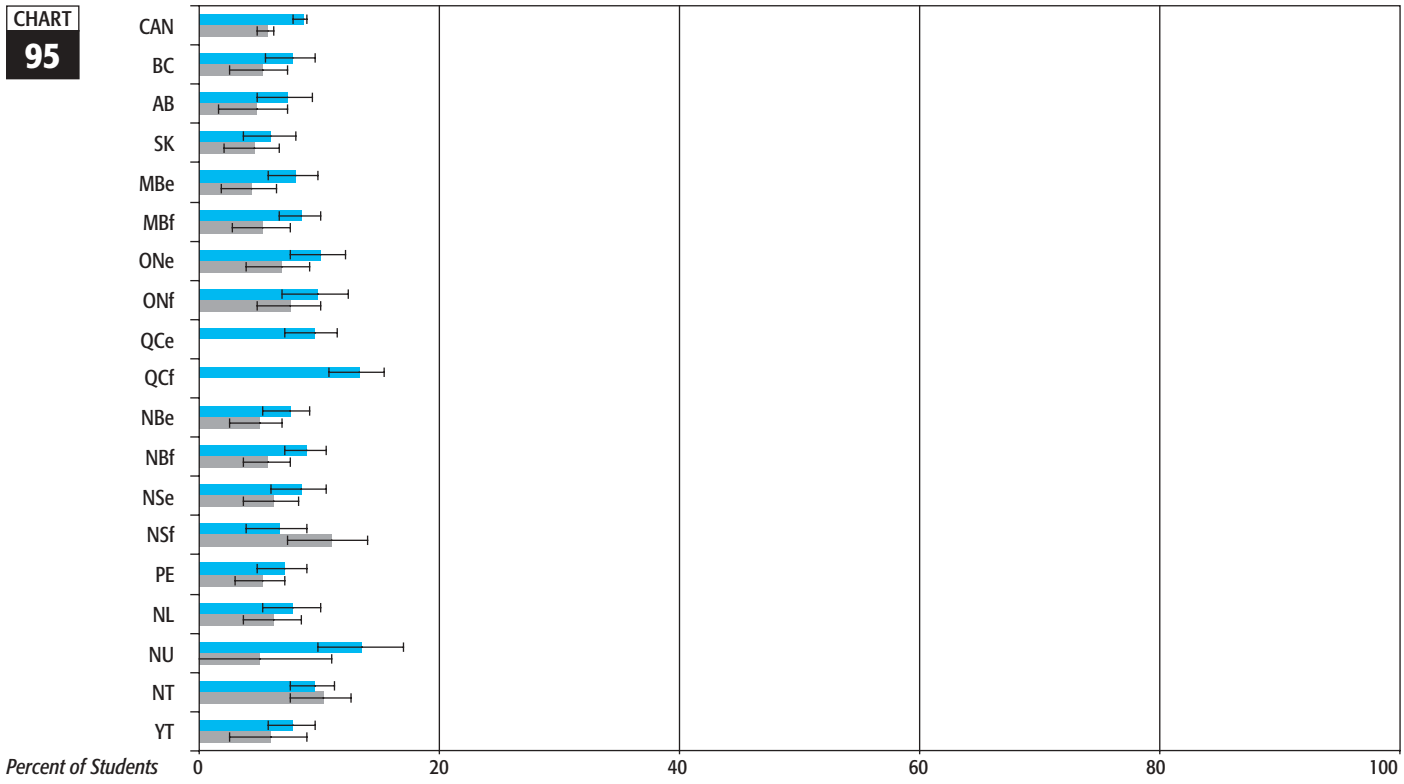
CHART 94



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	49	55	55	40	47	50	59	49	54	54	44	42	46	34	40	61	36	48	58
16 Years	52	56	53	49	47	54	57	53	–	–	44	51	54	59	48	62	36	47	49

Percentage of students using computer one hour or more per week to learn mathematics outside of school hours

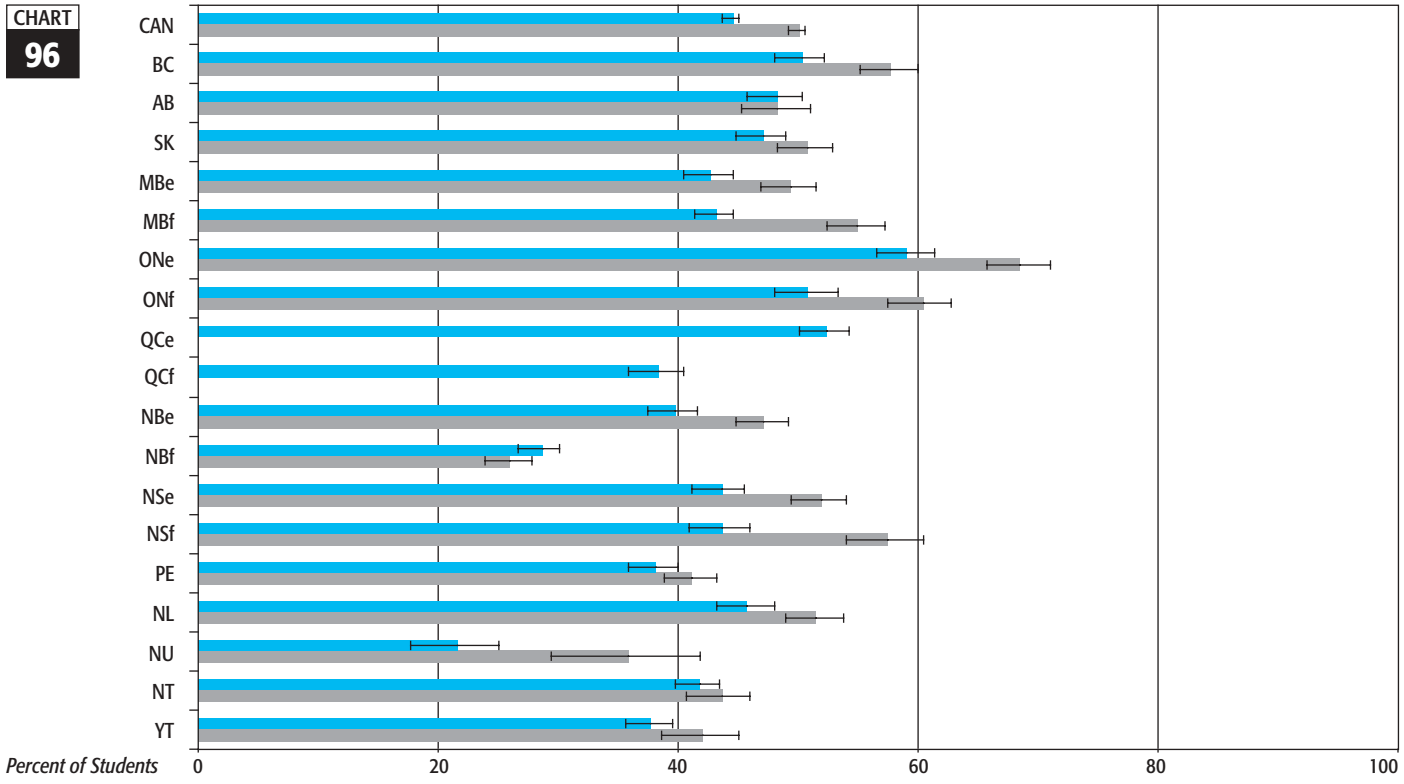
CHART 95



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	8	7	7	6	8	8	10	10	9	13	7	9	8	6	7	8	13	9	8
16 Years	5	5	5	4	4	5	7	7	–	–	5	6	6	11	5	6	5	10	6

Percentage of students using computer one hour or more per week for other school work outside of school hours

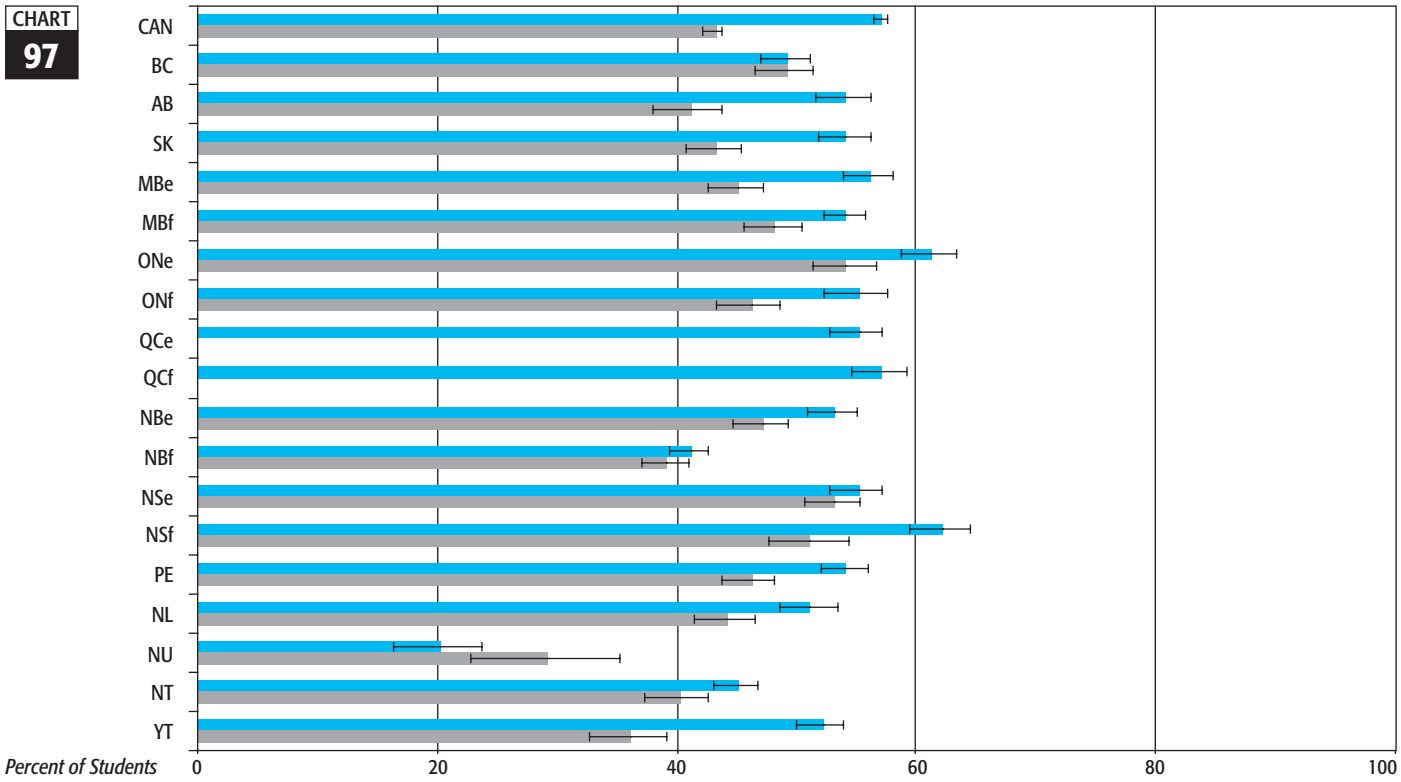
CHART 96



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	44	50	48	47	43	43	59	51	52	38	40	28	43	43	38	46	21	42	38
16 Years	50	58	48	51	49	55	68	60	–	–	47	26	52	57	41	51	36	43	42

Percentage of students using home computer three hours or more per week for entertainment

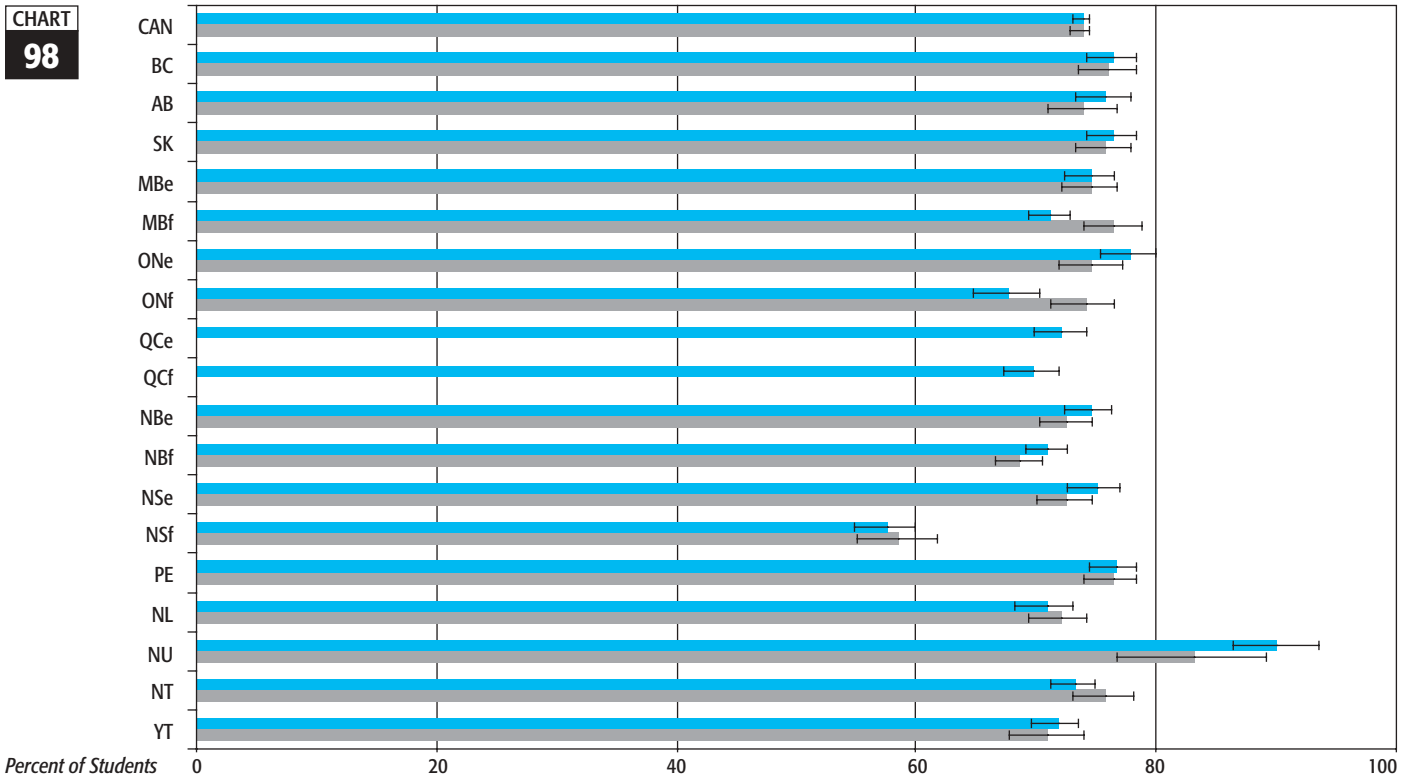
CHART 97



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	57	49	54	54	56	54	61	55	55	57	53	41	55	62	54	51	20	45	52
16 Years	43	49	41	43	45	48	54	46	–	–	47	39	53	51	46	44	29	40	36

Percentage of students agreeing with the statement "I feel good about school"

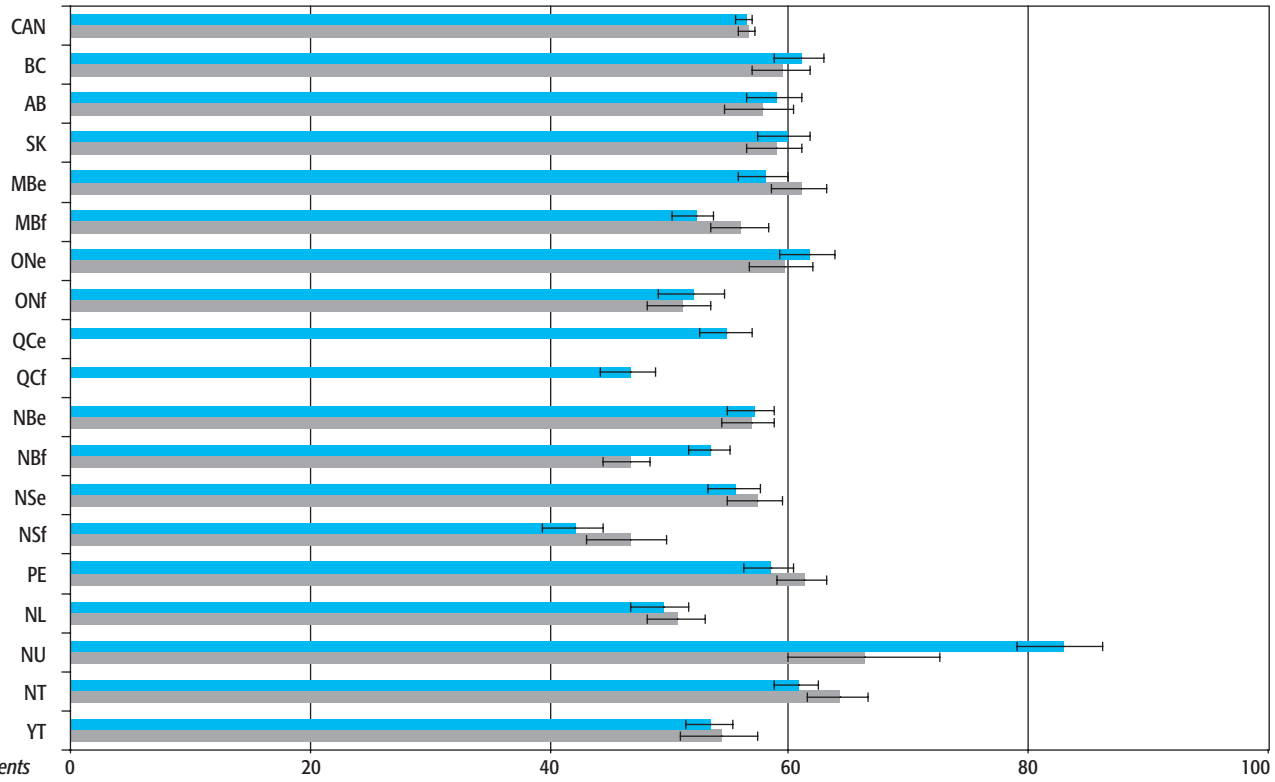
CHART 98



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	74	76	75	76	74	71	78	68	72	70	74	71	75	57	76	71	90	73	72
16 Years	74	76	74	76	75	76	74	74	–	–	72	68	72	58	76	72	83	76	71

Percentage of students agreeing with the statement "I enjoy going to school"

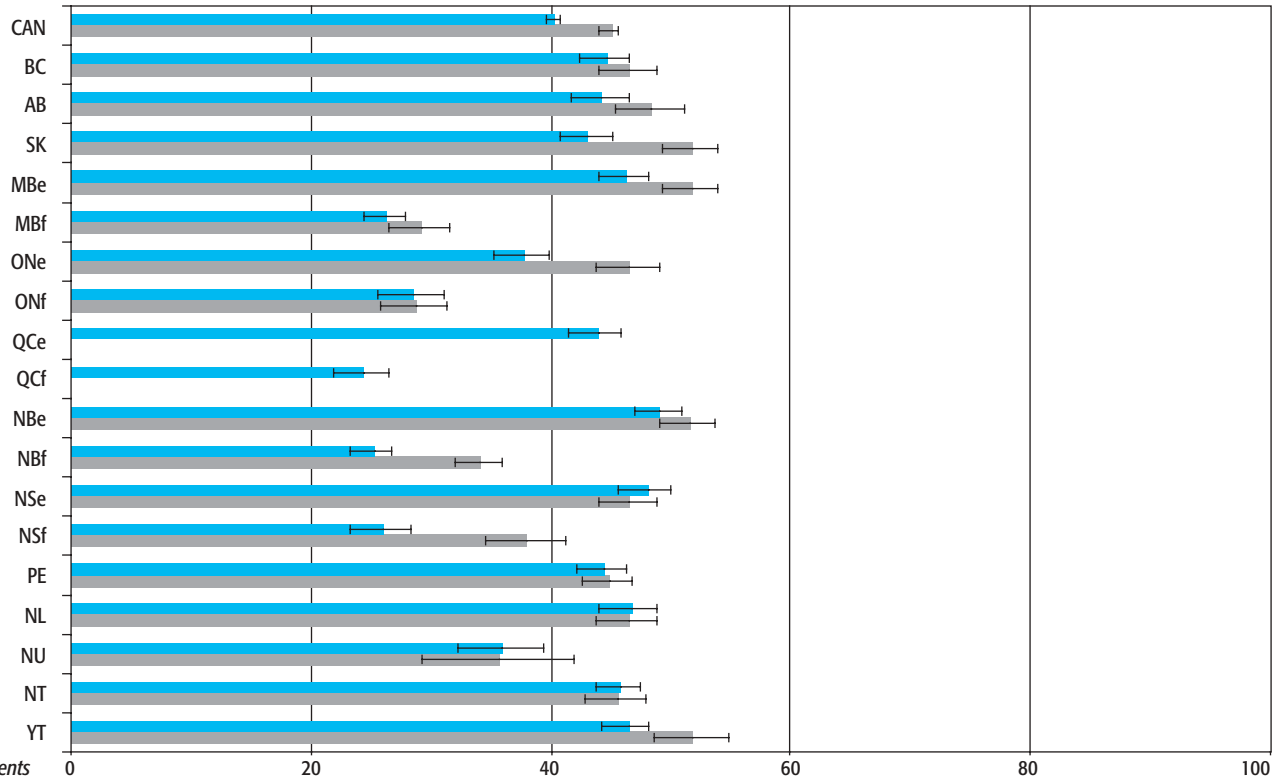
CHART 99



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	56	61	59	60	58	52	62	52	55	47	57	53	55	42	58	49	83	61	53
16 Years	57	59	58	59	61	56	59	51	–	–	57	46	57	46	61	51	66	64	54

Percentage of students agreeing with the statement "There is not much interesting to do in school"

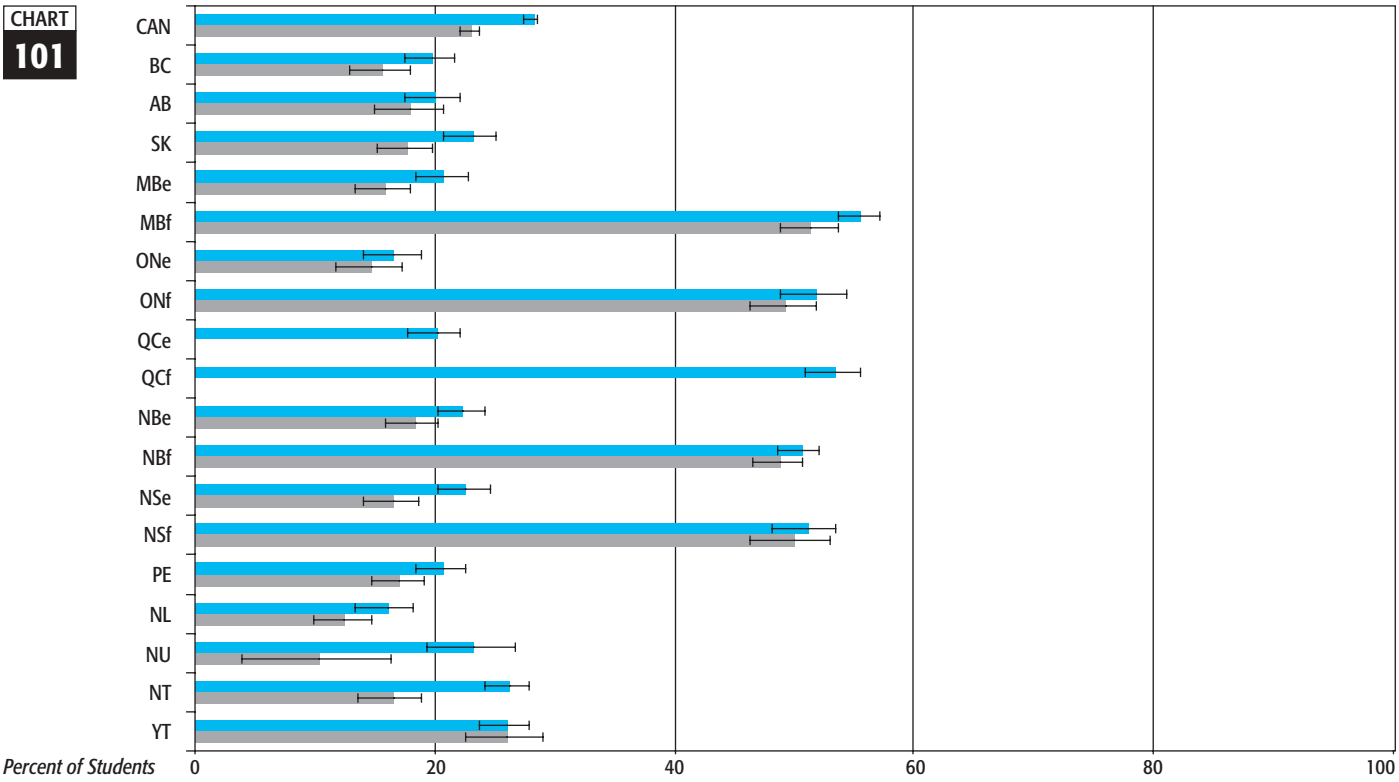
CHART 100



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	40	44	44	43	46	26	38	28	44	24	49	25	48	26	44	47	36	46	46
16 Years	45	46	48	52	52	29	46	29	–	–	51	34	46	38	45	46	36	45	52

Percentage of students agreeing with the statement "I am bossed around too much in school"

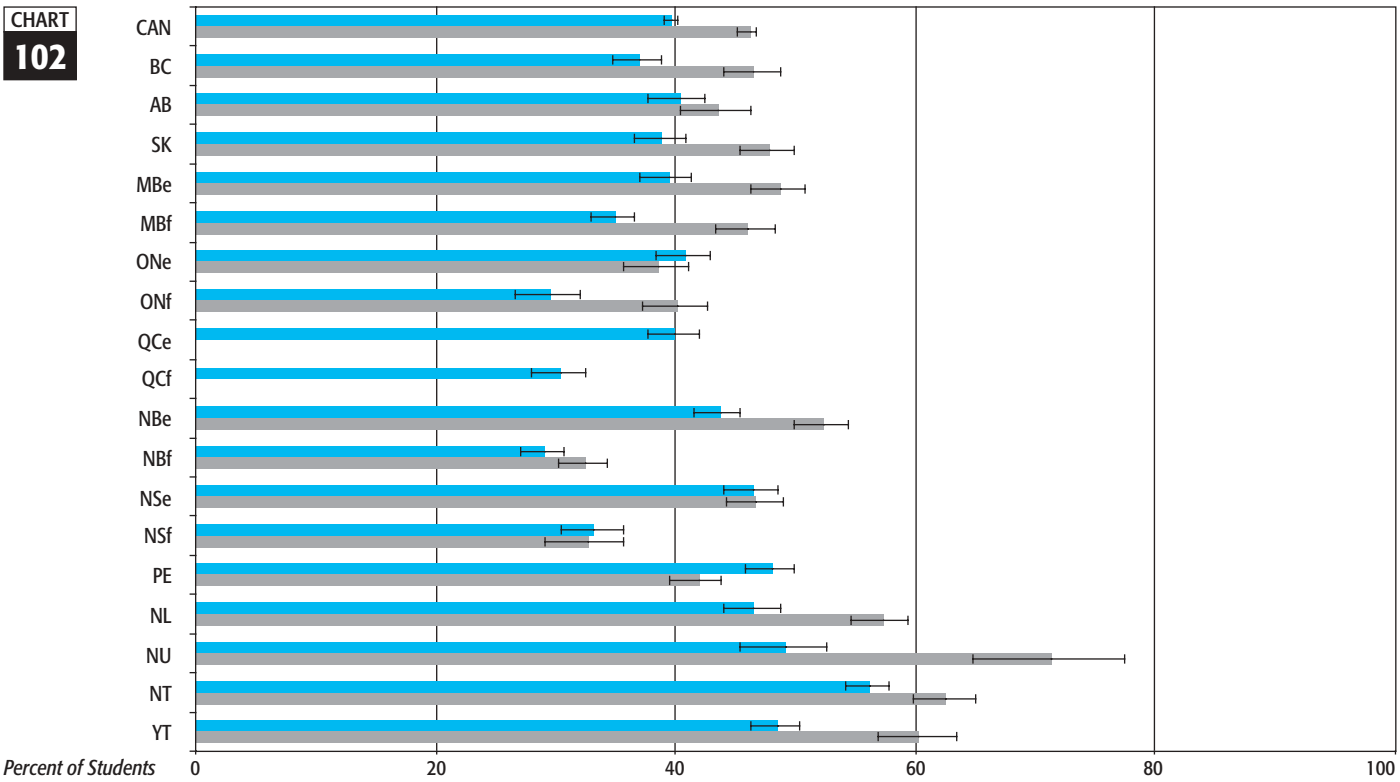
CHART 101



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	28	20	20	23	21	55	16	52	20	53	22	50	22	51	20	16	23	26	26
16 Years	23	15	18	18	16	51	15	49	–	–	18	49	16	50	17	12	10	16	26

Percentage of students absent six or more days this year

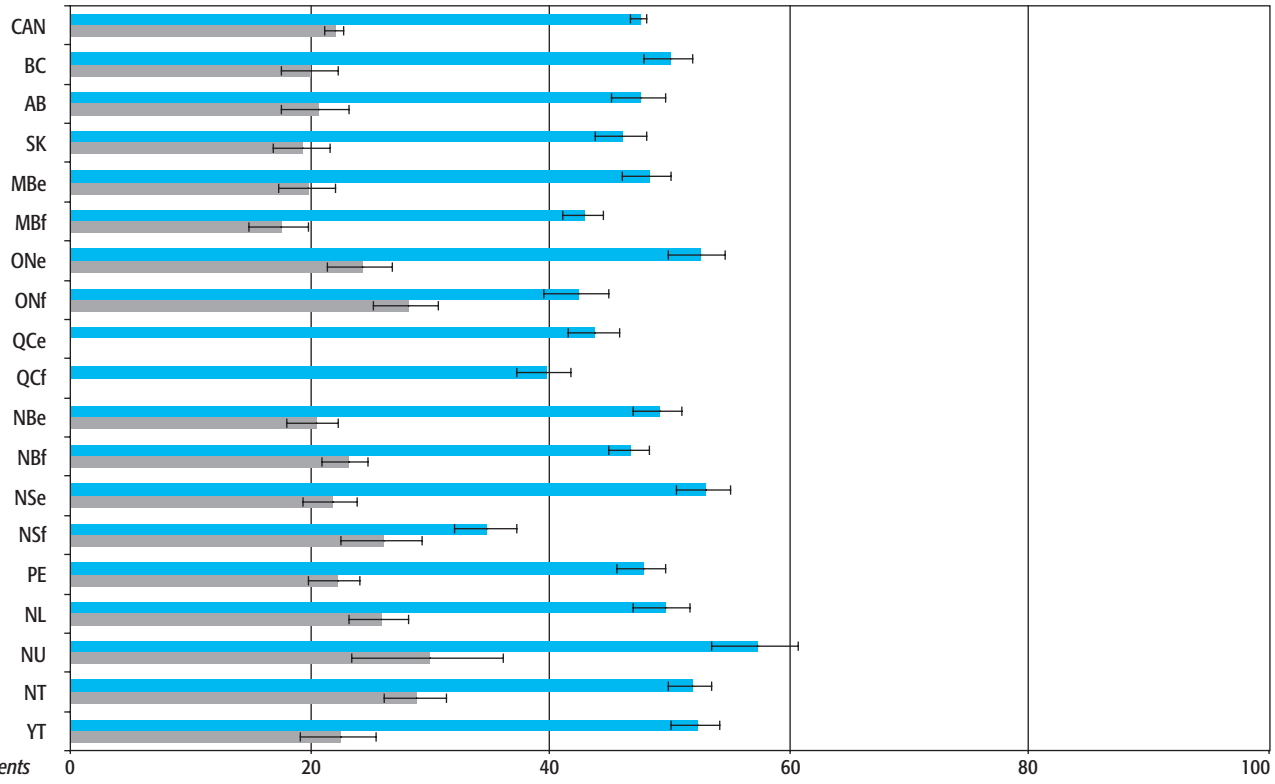
CHART 102



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	40	37	40	39	39	35	41	29	40	30	43	29	46	33	48	46	49	56	48
16 Years	46	46	43	48	49	46	38	40	–	–	52	32	47	32	42	57	71	62	60

Percentage of students who work with parents on mathematics homework a few times a week or more

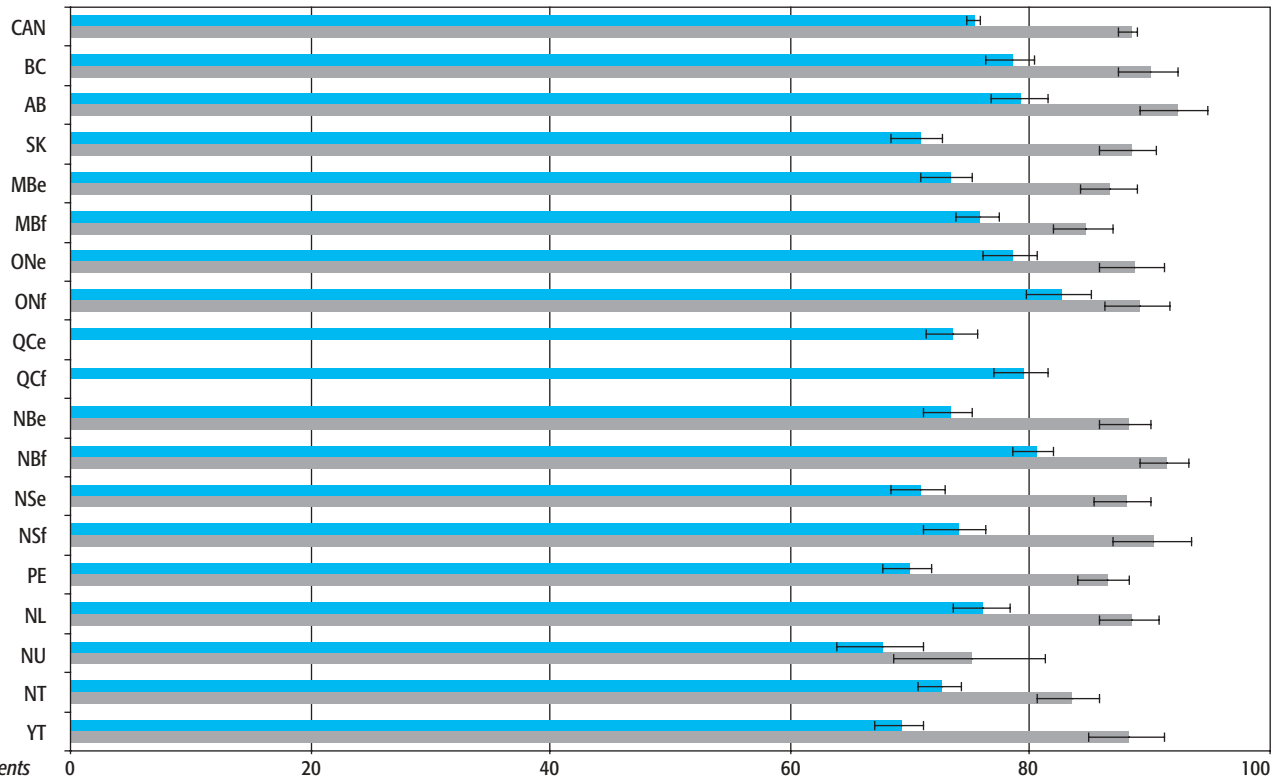
CHART 103



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	47	50	47	46	48	43	52	42	44	39	49	47	53	35	48	49	57	52	52
16 Years	22	20	20	19	20	17	24	28	–	–	20	23	22	26	22	26	30	29	22

Percentage of students who discuss their future with parents a few times a week or more

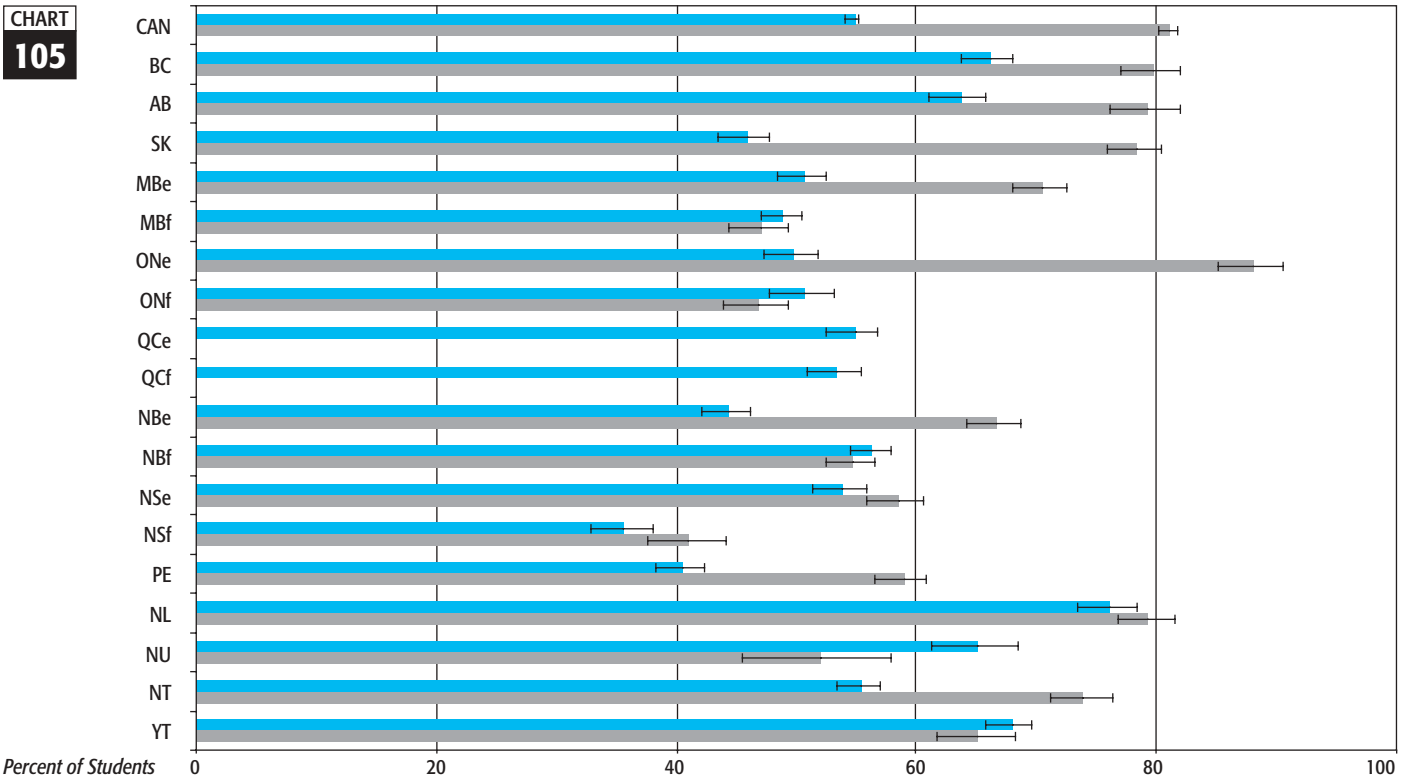
CHART 104



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	75	78	79	71	73	76	78	82	73	79	73	80	71	74	70	76	67	73	69
16 Years	88	90	92	88	87	84	88	89	–	–	88	91	88	90	86	88	75	83	88

Percentage of students reporting that the teacher gives notes in mathematics classes a few times a week or more

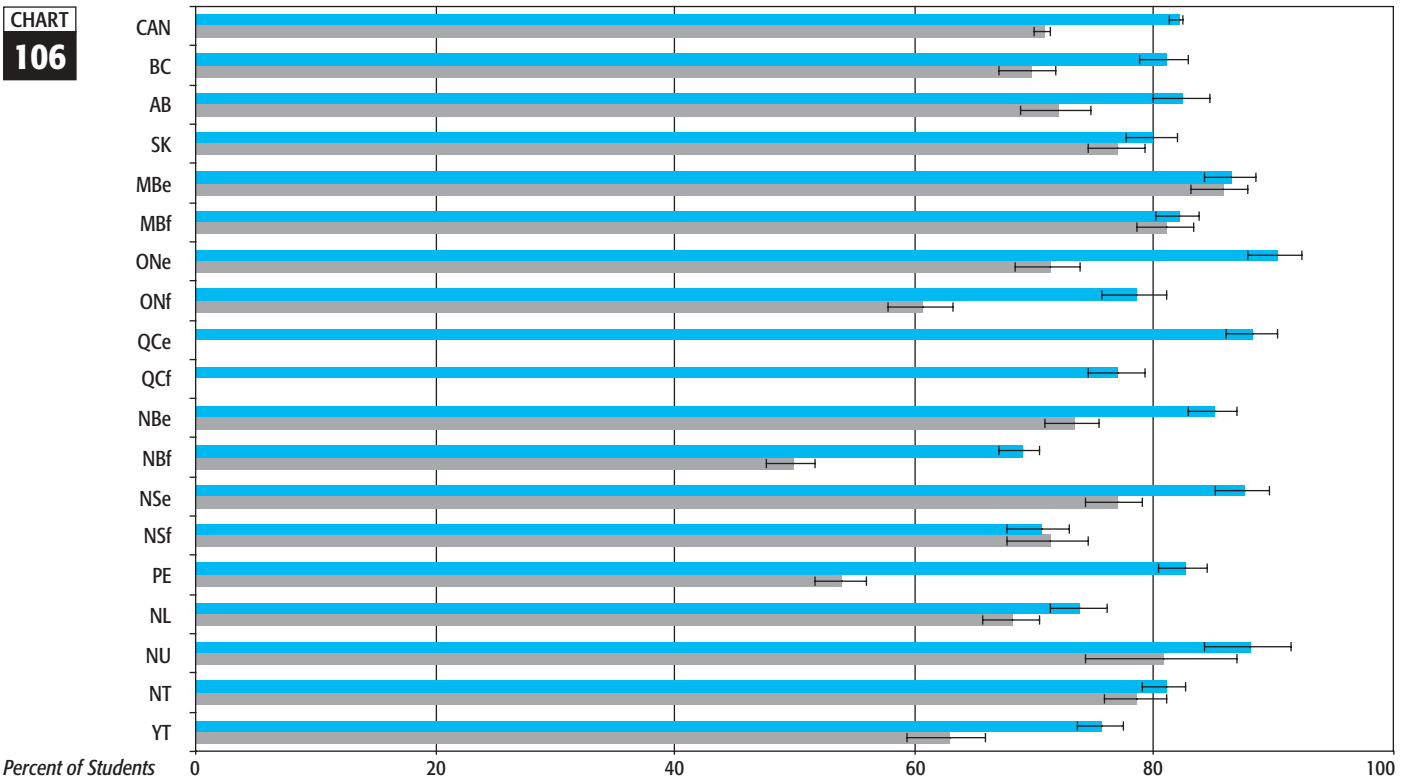
CHART 105



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	55	66	63	46	50	49	50	50	55	53	44	56	54	35	40	76	65	55	68
16 Years	81	80	79	78	70	47	88	47	–	–	66	54	58	41	59	79	52	74	65

Percentage of students reporting that they use workbooks or worksheets in mathematics classes a few times a week or more

CHART 106



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	82	81	82	80	86	82	90	78	88	77	85	69	87	70	82	74	88	81	75
16 Years	71	69	72	77	85	81	71	60	–	–	73	50	77	71	54	68	81	78	63

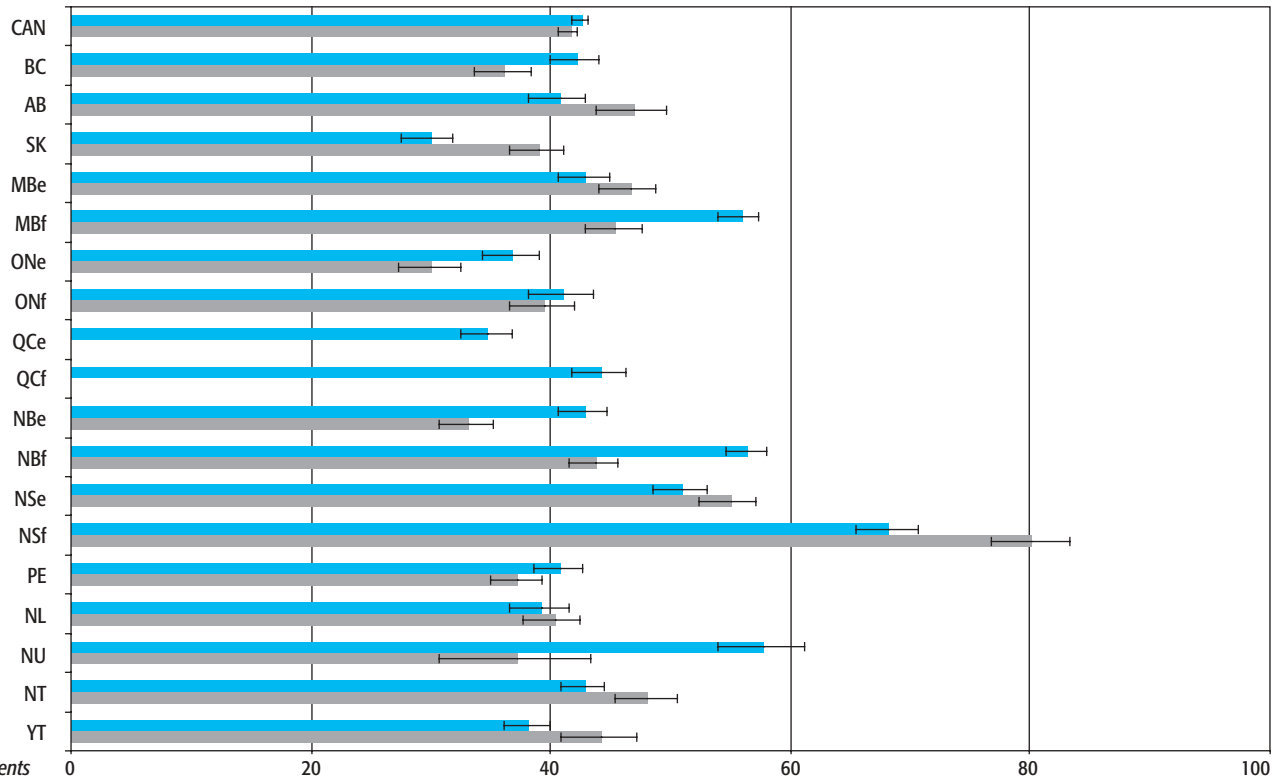
Percentage of students reporting that they work alone on assigned work in mathematics classes a few times a week or more

CHART 107

	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	84	84	89	89	85	80	90	89	83	81	82	81	79	62	86	82	73	83	85
16 Years	81	83	82	85	79	78	86	85	–	–	86	81	72	48	81	77	81	84	83

Percentage of students reporting that they work in pairs or small groups in mathematics classes a few times a week or more

CHART 108



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	42	42	41	30	43	56	37	41	35	44	43	56	51	68	41	39	58	43	38
16 Years	41	46	47	39	46	45	30	39	–	–	33	44	55	80	37	40	37	48	44

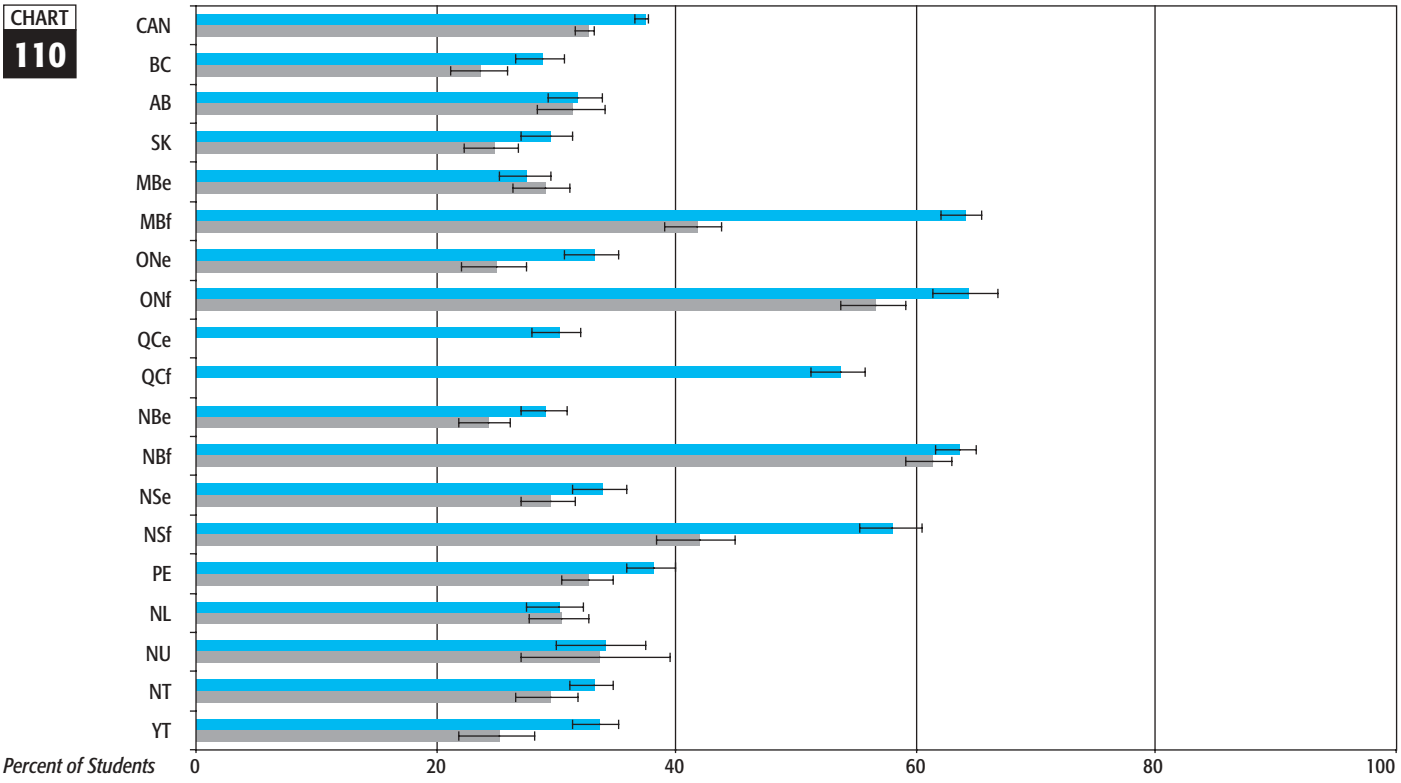
Percentage of students reporting that the teacher helps individual students with their work in mathematics classes a few times a week or more

CHART 109

	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	82	85	87	84	85	72	87	68	79	73	83	77	84	78	85	87	88	85	87
16 Years	83	85	88	88	85	67	86	74	–	–	83	77	85	66	87	88	81	89	76

Percentage of students reporting use of mathematics books and magazines (other than textbooks) in mathematics classes a few times a week or more

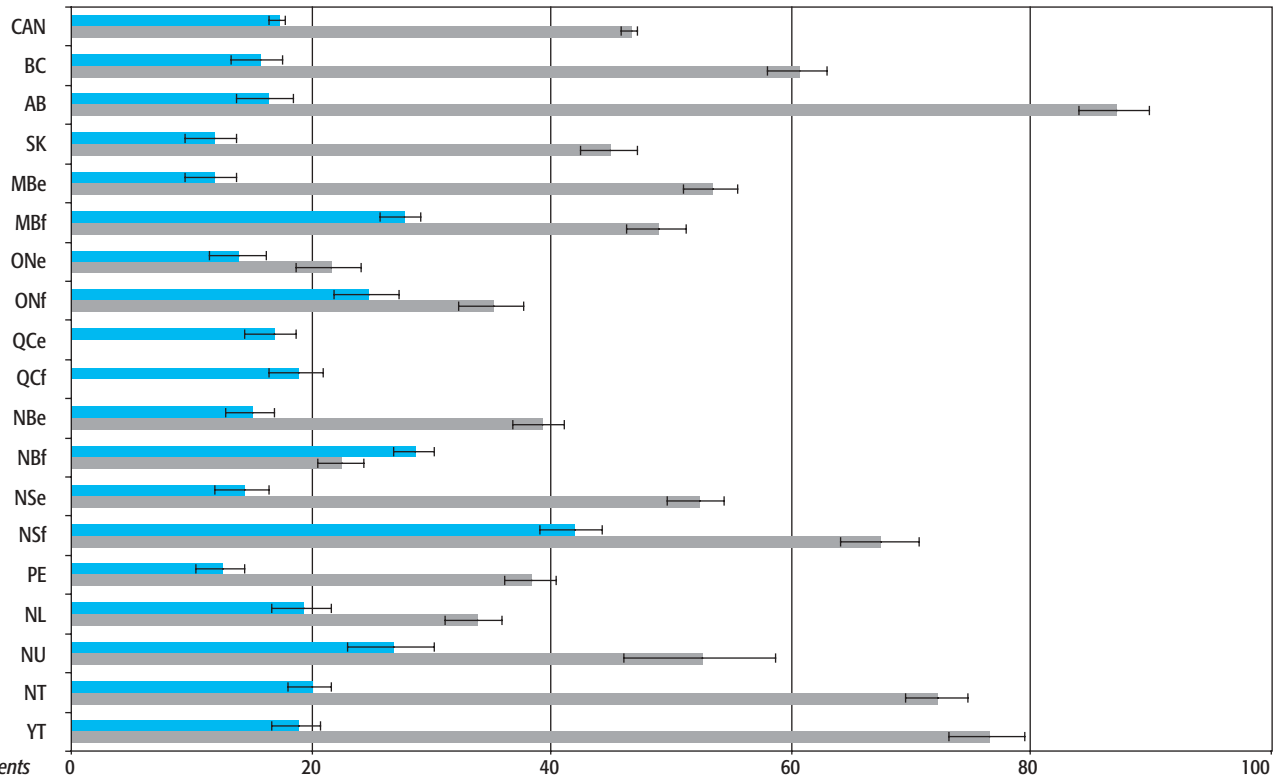
CHART 110



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	37	29	32	29	27	64	33	64	30	53	29	63	34	58	38	30	34	33	33
16 Years	32	24	31	25	29	41	25	56	–	–	24	61	29	42	33	30	33	29	25

Percentage of students reporting use of graphing calculators in mathematics classes a few times a week or more

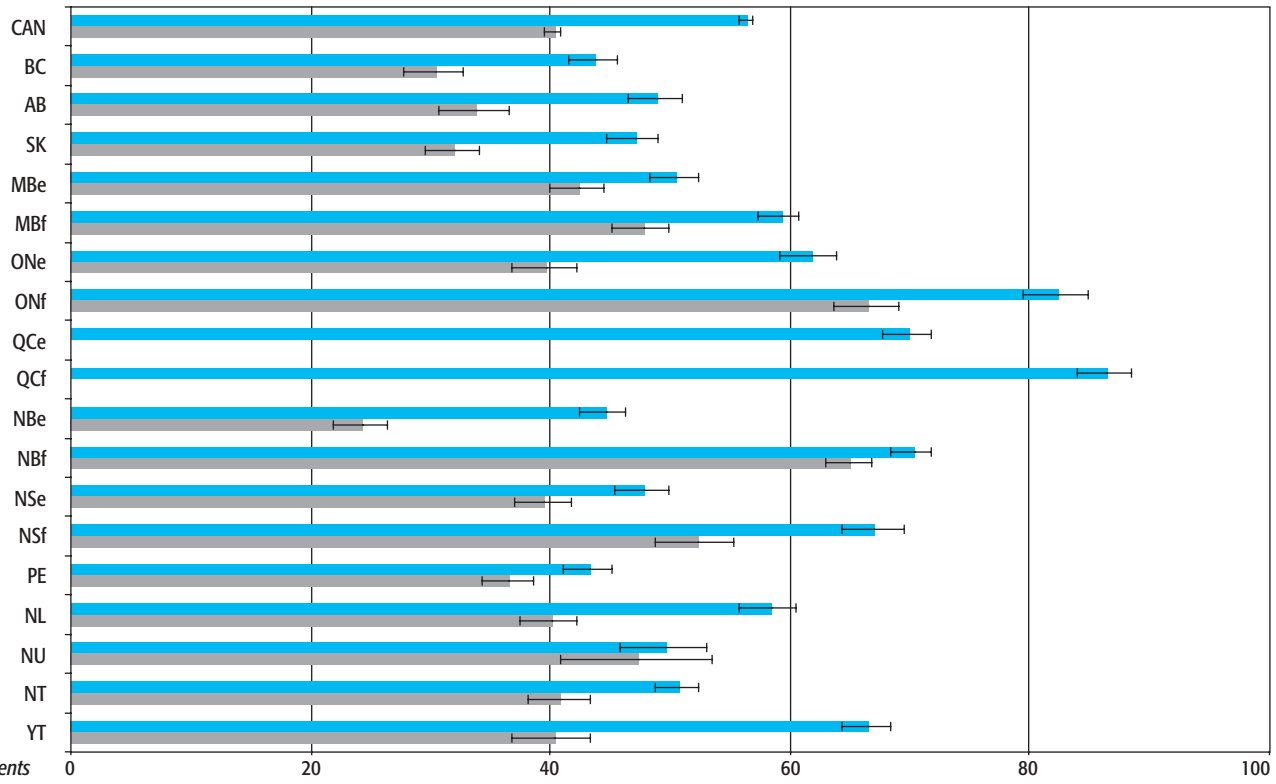
CHART 111



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	17	15	16	12	12	28	14	25	17	19	15	29	14	42	12	19	27	20	19
16 Years	46	60	87	45	53	49	21	35	–	–	39	22	52	67	38	34	52	72	76

Percentage of students reporting use of measuring devices in mathematics classes a few times a week or more

CHART 112



	CAN	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
13 Years	56	44	49	47	50	59	62	82	70	86	44	70	48	67	43	58	49	51	66
16 Years	40	30	34	32	42	48	40	66	–	–	24	65	39	52	36	40	47	41	40

CONTEXT FACTORS AND ACHIEVEMENT

Student achievement is influenced by an enormous number of variables. Some of these, such as student ability and socio-economic status, have been extensively studied. Others, especially many of the factors that are subject to educational policy influence, are less well documented. One of the functions of large-scale assessments is to add to our understanding of the factors influencing achievement. The addition of comprehensive questionnaires to the SAIP assessments was intended to allow some progress to be made toward this goal.

This section presents an exploratory analysis based on simple bivariate relationships between selected questionnaire variables and achievement in mathematics content and problem solving. Following the pattern established in SAIP reports, the results are given for each jurisdiction. However, the emphasis here shifts from jurisdictional comparisons to finding stable relationships. Results by jurisdiction should therefore be thought of as "replications" rather than as comparisons across jurisdictions. While it is possible that some of the factors influencing achievement will operate differently in different settings (e.g., correlate positively with achievement in some jurisdictions and negatively in others), the analysis is not focused directly on such differences.

It is also important to recognize that, because students learn in complex ways, no single variable can be expected to stand out as having a large influence on achievement. Most of the actual correlations reported are small, even though they tend to occur in consistent patterns.

Results of the type presented here cannot be interpreted as establishing causal directions. Nevertheless, the conceptual model being used assumes that input and process variables affect achievement and not the other way around. A comprehensive analysis of the SAIP data would require efforts to model achievement using particular combinations of variables and to test such models statistically. It is hoped that the results presented here will stimulate further research on ways of modelling achievement. The relationships given point to some possible directions for such research.

For the student data, a direct relationship can be established between individual achievement and individual questionnaire responses. For the school questionnaires, the student achievement results were first aggregated to the school level and reported as the proportion of students in the school at or above the criterion (level 2 for 13-year-olds and level 3 for 16-year-olds). Analysis of the teacher questionnaire results has been excluded because an accurate match of teacher identifiers with student identifiers could not be made.

Statistical Note: Student Results

Student results are based on cross-tabulations of three levels of achievement (below, at, or above the criterion) with categories from the questionnaire items. This type of data is ordinal (rank order) in nature. A statistic known as Kendall tau_b is used as the measure of relationship for this type of data. The relationship is considered statistically significant if the probability that a value of tau_b as large as that observed can occur by chance is .10 or less. The .10 level of significance rather than the more conventional .05 level is used because of the large number of replications available. When reporting a large number of statistical tests, each at the .10 level of significance, one in ten such tests can be considered as a "false positive." For this reason, the emphasis here is on results that show consistent patterns across jurisdictions. The results should not be used to compare jurisdictions. It was actually rare to find results in opposite directions from one jurisdiction to another. Differences that were not statistically significant were virtually all in the same direction as those labelled significant.

A total of 25 questionnaire variables were selected for detailed analysis based on preliminary screening using the overall results for Canada. Results for all of these are summarized in Table 1. (The detailed cross-tabulations appear in Appendix B.) Many of these variables are representative of a particular category, with other variables within the same category generally yielding similar patterns of results. For example, while both mother's and father's education were available, only mother's education is reported because the general relationship with achievement is similar for both.

Student Background and Aspirations

Mother's education is positively associated with achievement throughout. Similar results were found for father's education and for mother's and father's occupation. This is a common result in studies of this nature, and simply reinforces the well-established relationship between achievement and socio-economic status.

Speaking the language of the assessment at home shows effects in a number of jurisdictions, particularly where the number who speak a language other than that of the assessment is fairly large. There was a tendency for those speaking the language of the assessment at home to have higher achievement than those who do not. However, it is difficult to place any clear interpretation on these results because the numbers not speaking the language of the assessment at home were very small in many populations (thus requiring high correlations for significance), and also because the effect does not replicate as clearly here as in some other cases. In particular, the results in two instances for British Columbia are in the opposite direction from others. It is possible that the effects of language are more pronounced in some circumstances than others. For example, the British Columbia results suggest the possibility that those speaking immigrant languages perform better than others. For most other jurisdictions, the differences are more likely between those speaking an official language or an Aboriginal language different from the language on the assessment. It is important to examine these results in more detail as they may relate to socio-economic status or other variables.

The descriptive results indicated that more than 90% of 16-year-old students plan to continue their education beyond high school, with university being the predominant destination. All other categories of postsecondary studies were therefore combined for analysis. In general, those planning university education perform better than those planning other forms of postsecondary education. It is interesting to note, however, that substantial numbers of university-bound students perform below the criterion. This suggests that such students may be headed for some difficulty at the university level. On the other hand, it is likely that large numbers of those intending to attend university will actually change their minds before the end of high school or will fail to gain admission. The impact of mathematics achievement on the ultimate postsecondary destination of students deserves further investigation.

Mathematics achievement is higher among those planning a career requiring education in mathematics than among those who do not. This is a good example of an area in which the direction of causality is not at all clear. On the one hand, those who do better in mathematics may be attracted to fields requiring mathematics. However, it is also plausible to argue that those planning mathematics-related careers may do what is needed to perform well in mathematics.

Mathematics Activities and Attitudes

Students can do a number of things outside of school to enhance their mathematics performance. Among the most obvious are taking tutoring and doing homework.

The results for taking tutoring are generally negative; that is, those taking tutoring do less well than those who do not. However, it is not at all clear how these results should be interpreted. It is rather far-fetched to suggest that students take tutoring to reduce their performance. It is much more likely that students who are doing poorly use tutoring in an effort to improve. However, this raises the question of the effectiveness of tutoring. What we do not know, of course, is whether the same students would do worse without the tutoring. At the same time, the data indicate that tutoring is unlikely to be a "turn-around" device, which transforms poor to average or good achievement. The hypothesis that tutoring may exert a marginally positive effect is quite plausible, but this cannot be confirmed from the data at hand.

Time spent on mathematics homework is positively related to achievement. However, a negative pattern is observed for working with parents on mathematics homework. A similar interpretation to that for tutoring likely applies to the latter results. Indeed, there is a significant positive correlation between being tutored and having parents help with homework. Students who are doing poorly might be expected to seek or be offered assistance from their parents. Parents of the same students might be expected more often than others to seek tutoring for their children. It would appear that neither tutoring nor parental help is decisive in changing achievement levels. However, it would be inappropriate to infer from these results that these activities are undesirable because both might have marginal effects that cannot be detected from this type of analysis.

Student attitudes toward mathematics show a pattern of relationships with achievement. Negative associations are found for perceived difficulty of mathematics and attribution of low mathematics marks to bad luck. The strong pattern of positive associations for persistence at a difficult mathematics problem until it is solved suggests an element of internal motivation on the part of higher-achieving students. More generally, the results for other similar items reveal a pattern that might be interpreted as fatalism or external motivation on the part of low-achieving students and internal motivation on the part of higher-achieving students. Similarly, correlations of achievement with positive perceptions of the quality of school life also tend to be positive. More detailed analysis of the set of attribution and motivation items, particularly their relationship to behaviour as well as achievement, could shed further light on this issue.

Attitudes and perceptions about school are found to be associated with the rate of absence. Students with more positive attitudes tend to have less absenteeism. Absenteeism, in turn, is associated with lower achievement. However, this relationship does not replicate as strongly as most of the others reported. This may relate to the precision of the absence scale, which was not detailed enough to identify long periods of absence. Most students, in fact, were absent not more than 2 to 3% of the time.

Classroom Activities

The conceptual model underlying the questionnaires suggests that "proximal" variables, or those that touch most closely on the day-to-day lives of teachers and students, are more likely to be related to achievement than more "distal" or broad policy variables. This area is of considerable interest because variables related to school and classroom practices are the ones that are most amenable to change through teacher education, targeted resource allocations, school leadership practices, and other means that are within the control of the school system.

The model itself does not give a clear picture of the expected direction of association for particular kinds of activities. A long list of items in both student and teacher questionnaires was therefore prepared, in order to give a picture of classroom activities and of the use of classroom resources and materials. Within the limitations of these self-report instruments, these items present a fairly comprehensive picture of how mathematics is taught. The relationships with achievement given in Table 1 can now be used to give some preliminary indications of effective and less effective practices.

Teacher note-giving is one of the few variables to show a different pattern for the two age groups. Note-giving is negatively associated with achievement for 13-year-olds and positively associated with achievement for 16-year-olds. However, a number of other activities that might be associated with a highly structured approach to teaching tend to show positive relationships with achievement. The teacher showing students how to do problems, assigning homework, working on textbook exercises, and students asking the teacher questions are the examples given. However, other similar activities show the same pattern. On the other hand, activities indicative of lower levels of structure, such as working on projects, working in pairs or small groups, discussing things other than the lesson topic, and classroom disruptions show negative relationships.

A similar picture emerges for resource use. Use of books and magazines other than the textbook, use of guest speakers or experts in mathematics, and use of slides, films, and videos all

show negative associations with achievement. Although such activities are often encouraged as motivational devices and ways of increasing breadth of exposure to the subject, these clearly do not enhance achievement as measured by the SAIP assessments.

The use of calculators in mathematics classes has been a source of controversy for many years. Opponents argue that too-early use of calculators detracts from learning basic skills, while proponents tend to take the position that mathematics is not primarily about computation but about problem solving. The results here show a clear pattern of positive relationships between calculator use and achievement for both content and problem solving. Nevertheless, it would be premature to use these results to settle the argument because, by the time students reach the SAIP age levels, it should be reasonable to assume that they are learning things other than basic skills. Certainly the SAIP assessment is not primarily oriented toward basic computations. Given all of this, the most obvious expectation would be that there is no relationship between calculator use and SAIP achievement.

The observed results obviously require further analysis. One possibility is that calculator use implies less need to dwell on basic computations and hence more time for higher level activities. Another is that calculator use is linked to structured teaching, as already discussed. The results actually show a positive relationship between calculator use and structured classroom activities, but no relationship between calculator use and unstructured activities.

As already indicated, computers are not widely used in mathematics teaching. The relationship between computer use and achievement is generally negative. Because computer use is found to vary substantially across jurisdictions, this is one area that might be investigated in more detail as a possible source of achievement differences. While the hypothesis that increased computer use may detract from achievement may appear counterintuitive, it is possible that computer use is either time-consuming or relatively unstructured in nature, detracting from more focused activities. It is also possible that, like tutoring, computers are used more frequently with lower achieving students, although it is not obvious why this would be the case. Again, one would not wish to make a strong inference from the results at hand. Nevertheless, considering the strong interest in computers as learning devices and the large investment of school resources being made in computers, the negative results give reason to pursue this issue in more detail.

Thus, the overall picture of classroom activities and resource use suggests that higher achievement is associated with a fairly narrow range of activities representing a highly structured approach to teaching. Activities and resources that reflect an attempt to broaden the repertoire or that result in lost time show negative relationships. This result needs to be further examined as it seems contrary to the thrust of mathematics curriculum toward encouraging students to be active learners.

TABLE 1 SIGNIFICANT CORRELATIONS BETWEEN STUDENT QUESTIONNAIRE VARIABLES AND ACHIEVEMENT

s+ significant positive correlation, s- significant negative correlation, level of significance .10

Variable	Test	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Mother's education	Content 13	s+	s+		s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+
	Content 16	s+	s+		s+	s+	s+	s+			s+	s+	s+	s+	s+	s+	s+	s+	
	Problem 13	s+	s+		s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	
	Problem 16	s+	s+		s+	s+	s+	s+			s+	s+	s+	s+	s+	s+	s+		
Language of the test spoken at home?	Content 13				s+			s+									s+		
	Content 16	s-			s+												s+	s+	
	Problem 13	s-							s+	s+	s+	s+				s+	s+	s+	s+
	Problem 16										s+	s+			s+		s+	s+	
University versus non-university future	Content 13	s+	s+		s+		s+				s+	s+	s+		s+	s+	s+		s+
	Content 16	s+	s+	s+	s+		s+				s+		s+		s+	s+		s+	
Plan to work in a field requiring math	Content 13	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+	s+	s+	s+	s+		s+
	Content 16	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+	s+	s+	s+			s+
Taking mathematics tutoring	Content 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	s-	s-	s-	s-
	Content 16		s-	s-							s-	s-		s-	s-	s-		s-	
	Problem 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	s-		s-	s-
	Problem 16		s-	s-			s-	s-			s-	s-	s-		s-				s-
Time on mathematics homework	Content 13	s+	s+			s+		s+						s+				s+	
	Content 16	s+	s+		s+	s+	s+	s+			s+	s+	s+		s+	s+	s+		s+
	Problem 13	s+	s+	s+			s+	s+	s+					s+				s+	
	Problem 16	s+	s+		s+		s+	s+			s+	s+	s+		s+	s+		s+	
Perceived difficulty of mathematics	Content 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	s-
	Content 16	s-	s-	s-	s-	s-	s-	s-			s-	s-	s-		s-	s-		s-	s-
	Problem 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	s-
	Problem 16	s-	s-	s-	s-	s-	s-	s-			s-	s-	s-		s-	s-			s-
Persistance in solving a difficult mathematics problem	Content 13	s+	s+	s+	s+	s+	s+	s+		s+	s+	s+	s+		s+	s+	s+		
	Content 16	s+		s+	s+	s+	s+	s+			s+	s+	s+	s+	s+	s+	s+		s+
	Problem 13	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+	s+		s+		s+		
	Problem 16	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+		s+	s+		s+	s+
Attribution of low mark to bad luck	Content 13			s-	s-			s-		s-	s-	s-	s-		s-	s-		s-	
	Content 16				s-						s-	s-							
	Problem 13	s-		s-	s-	s-		s-		s-		s-			s-		s-		
	Problem 16	s-		s-	s-	s-	s-						s-		s-				
Days absent from school	Content 13	s-	s-							s-									
	Content 16	s-	s-	s-	s-		s-	s-				s-	s-		s-	s-			
	Problem 13	s-				s-						s-							
	Problem 16	s-			s-		s-				s-	s-			s-	s-			

Shaded areas represent missing data or insufficient data for analysis.

TABLE 1 SIGNIFICANT CORRELATIONS BETWEEN STUDENT QUESTIONNAIRE VARIABLES AND ACHIEVEMENT (CONTINUED)

s+ significant positive correlation, s- significant negative correlation, level of significance .10

Variable	Test	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Work with parents on mathematics homework	Content 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s+
	Content 16	s-	s-	s-	s-	s-	s-	s-			s-	s-	s-			s-	s-	s-	
	Problem 13	s-	s-	s-	s-	s-	s-	s-		s-	s-	s-	s-		s-	s-		s-	
	Problem 16	s-			s-		s-	s-			s-	s-	s-		s-	s-		s-	
Teacher gives notes	Content 13			s-			s-	s-	s-		s-	s-	s-		s-				
	Content 16	s+	s+		s+		s+	s+				s-			s+	s+		s+	
	Problem 13		s+	s-		s-		s-		s-	s-		s-		s-		s-	s-	
	Problem 16	s+	s+	s+	s+		s+									s+	s-	s+	s+
Teacher shows how to do problems	Content 13		s+		s+		s+								s+			s+	
	Content 16	s+	s+	s+	s+	s+	s+	s+				s+		s+				s+	
	Problem 13	s+			s+		s+				s+	s+					s+	s-	
	Problem 16	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+		s+	s+		s+	
We do mathematics projects	Content 13	s-		s-	s-		s-	s-	s-	s-	s-		s-	s-		s-	s-	s-	
	Content 16	s-	s-	s-	s-	s-	s-	s-			s-	s-	s-		s-	s-		s-	s-
	Problem 13	s-	s-		s-	s-	s-	s-	s-	s-	s-		s-		s-	s-	s-	s-	
	Problem 16	s-	s-	s-	s-	s-	s-	s-			s-	s-	s-			s-	s-		
We work in pairs or small groups	Content 13	s-		s-				s-		s-	s-	s-			s-		s-	s-	
	Content 16			s-	s-	s-	s-												
	Problem 13		s-	s-			s-					s-					s-		s+
	Problem 16		s-		s-														
Teacher assigns homework	Content 13		s+	s-	s+				s+								s+	s+	
	Content 16	s+	s+		s+	s+	s+	s+			s+	s+	s+		s+	s+			
	Problem 13	s+	s+			s+	s+						s+						
	Problem 16	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+	s+	s+		s+		s+
We work on textbook exercises	Content 13	s+		s+	s+	s+		s+		s+			s+			s+		s+	
	Content 16	s+	s+		s+							s+	s+					s+	
	Problem 13	s+							s+	s+	s+	s+			s+			s+	
	Problem 16				s+			s+			s+	s+	s+						
Students ask the teacher questions	Content 13	s+	s+	s+	s+			s+		s+		s+			s+	s+		s+	
	Content 16	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+	s+	s+	s+		s+	s+
	Problem 13	s+	s+	s+	s+				s+		s+					s+			
	Problem 16	s+	s+	s+	s+	s+	s+	s+			s+	s+	s+		s+			s+	
Discuss things other than the lesson topic	Content 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-		s-	s-		s-	
	Content 16	s-	s-	s-	s-		s-					s-			s-	s-	s-		s-
	Problem 13	s-	s-	s-	s-		s-		s-	s-		s-	s-			s-		s-	
	Problem 16	s-	s-		s-		s-					s-	s-		s-				

Shaded areas represent missing data or insufficient data for analysis.

TABLE 1 SIGNIFICANT CORRELATIONS BETWEEN STUDENT QUESTIONNAIRE VARIABLES AND ACHIEVEMENT (CONTINUED)

s+ significant positive correlation, s- significant negative correlation, level of significance .10

Variable	Test	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Lose 5-10 minutes per class because of disruptions	Content 13	s-	s-							s-	s-		s-		s-	s-			
	Content 16	s-	s-	s-	s-		s-				s-	s-	s-		s-	s-			
	Problem 13	s-	s-	s-			s-	s-	s-	s-	s-		s-						
	Problem 16	s-		s-	s-						s-	s-	s-	s-	s-	s-			
Use books and magazines other than textbooks	Content 13	s-	s-	s-	s-		s-	s-		s-	s-		s-	s-	s-	s-		s-	s-
	Content 16	s-	s-	s-	s-	s-	s-				s-	s-	s-	s-	s-			s-	
	Problem 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-			s-			
	Problem 16	s-		s-	s-		s-	s-			s-	s-	s-		s-	s-	s-	s-	s-
Use guest speakers or experts in mathematics	Content 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	
	Content 16	s-	s-		s-	s-	s-	s-			s-	s-	s-	s-		s-	s-	s-	s-
	Problem 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	s-	s-	s-	s-
	Problem 16	s-	s-	s-	s-	s-		s-			s-	s-	s-		s-	s-	s-	s-	
Use computers	Content 13	s-		s-			s-		s-	s-	s-	s-			s-	s-	s-	s-	
	Content 16	s-	s-		s-	s-	s-	s-				s-	s-	s-				s-	s-
	Problem 13		s-	s-		s-				s-	s-	s-				s-			
	Problem 16		s-		s-	s-		s-				s-	s-		s-			s-	
Use calculators	Content 13	s+	s+	s+	s+		s+		s+	s+					s+	s+	s+	s+	s+
	Content 16	s+		s+	s+	s+					s+	s+	s+	s+	s+	s+		s+	
	Problem 13	s+		s+	s+	s+	s+		s+	s+	s+	s+			s+	s+		s+	s+
	Problem 16	s+		s+							s+	s+	s+			s+			
Use slides, films, videos	Content 13	s-	s-	s-	s-		s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	
	Content 16	s-	s-		s-		s-					s-	s-	s-	s-				s-
	Problem 13	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-	s-		s-	s-		s-	
	Problem 16	s-		s-	s-		s-	s-			s-	s-	s-		s-	s-		s-	

Shaded areas represent missing data or insufficient data for analysis.

Statistical Note: School Results

Student achievement was aggregated to the school level by computing the percentage of students achieving at or above the criterion for each age group and each component of the assessment. The school achievement scale was therefore "equal interval" in nature, on a scale from 0 to 100. However, most of the school questionnaire variables were ordinal as before. The Kendall tau_b was therefore also used here in most cases. In a few cases, the questionnaire item was simply nominal (discrete categories, such as yes-no, with no scale implied). In these cases, it was appropriate to compare the mean school achievement percentage across the categories of the achievement scale. Variables for which this was done are noted in Table 2. Again, the emphasis is on results that show trends in a particular direction and not on comparisons between jurisdictions. As for the student results, differences that were not statistically significant were virtually all in the same direction as those labelled significant. Because of the small number of schools, larger correlations were required for statistical significance in the school level than in the student level analysis, so that fewer significant relationships were found.

The variables yielding the most consistent results at the school level were school demographic characteristics, the backgrounds of students in the school principals' perceptions of the impact of student background on achievement, and aspects of remediation and enrichment. Results for the twelve variables selected for presentation are given in Table 2. The detailed correlations appear in Appendix C.

School Demographics

A pattern of positive associations between achievement and the size of the community in which the school is located is evident. That is, schools in larger communities tend to have higher achievement. The one exception to the generally linear upward trend is found in medium-sized cities (100,000 to 500,000 people), where achievement is lower than in the communities in the two adjacent categories. It is noted that there may be some confounding with jurisdiction here, as such cities tend more often to be in lower- than higher-performing jurisdictions.

The pattern for school size is similar to that for community size, with larger schools tending to have higher performance than smaller ones. School size and community size are themselves highly correlated, so that these two sets of results are likely not independent of each other.

Class Size

Although relatively few significant correlations were found for class size, the general trend is in the opposite direction from expectations and other research. In this case, larger classes tend to be associated with higher achievement. Again, this is likely linked to a high correlation between school size and class size. This seems to suggest that negative effects of smaller schools may override any possible positive effects of smaller classes. Alternatively, both school size and class size may be confounded with other factors, such as type of community, language, or socio-economic status of the school, that contribute to achievement. Further analysis is needed to disentangle these effects. This is an important issue for policy because large class size is often viewed as a negative indicator of school quality. These results also need to be examined in light of recent large-scale class-size reduction efforts in Canada and elsewhere.

Public and Private Schools

For those provinces with enough private schools to permit analysis, the pattern was one of higher achievement for private schools. The Ontario anglophone population was an exception, with no significant relationship being found. Again, it would be risky to draw any causal conclusion from this result, especially because of the relatively strong association of socio-economic status and achievement and because socio-economic status is a significant factor in parent choice of private schools. Indeed, the recent PISA assessment indicated that the relative advantage of private schools in Canada largely disappears once socio-economic status is accounted for. Preliminary regression analysis for this study has indicated that a significant private school advantage remains even after controlling for SES. However, because only a few jurisdictions have significant numbers of private schools, and because the nature and level of public support for private schools differ, these results require further analysis and interpretation in light of policies on funding of private schools.

Student Backgrounds

Principals were asked to estimate the percentage of students in their schools with a variety of background characteristics that might inhibit learning. Results for the percentage of students with learning problems, from single-parent families, and with health and nutrition problems are shown in Table 2. There is a pattern of negative correlations with these characteristics. This pattern seems more pronounced in the Western provinces than elsewhere, although the general trend is negative throughout. All of these background characteristics are, of course, highly intercorrelated among themselves and with socio-economic status.

Teacher Specialization

The question asked here was whether mathematics classes are taught by homeroom teachers (responsible for subjects other than mathematics), subject teachers specialized in mathematics, or subject teachers specialized in other subjects. For 16-year-olds, most classes were taught by mathematics specialists, so that comparisons were not possible. For 13-year-olds, the relevant comparison was between homeroom teachers and subject teachers specialized in mathematics. A distinct pattern of results favouring mathematics specialists was found for the problem-solving component. However, these were not replicated for the content component.

Factors Limiting Ability to Provide Instruction

The results already noted for student background are repeated for questions in which the principal was asked about factors inhibiting the school's ability to provide instruction. Of the relatively long list of factors given, only those linked to student, family, and community backgrounds yielded clear patterns. Principals' reports of the inhibiting effects of lack of parental support, range of student abilities, students' home backgrounds, and community conditions all tended to correlate negatively with achievement. That is, the stronger these negative effects as reported by principals the lower the achievement level in the school.

It is interesting to note that similar effects were not found for shortages or inadequacies in instructional materials or facilities. Such factors as availability of computers, shortage of specialized teachers, condition of school buildings, and shortage of instructional space were generally unrelated to achievement. It is possible, of course, that principals may simply attribute low achievement to external rather than internal factors. However, these attributions are consistent with other findings that reinforce the importance of external conditions for achievement.

Other Factors

The school questionnaire contained a number of items on school policies and on the relative influence of various groups and agencies on school decision making. A number of questions were also included on school policies and practices in streaming, dealing with special needs students, semesterization of courses, and a variety of other issues that form important pillars of educational policy.

Although some of these showed significant effects at a pan-Canadian level, these did not replicate across jurisdictions to a sufficient extent to include in this report. It is not known if this is simply a matter of sampling error or if there are differences in the effects of these variables across jurisdictions. In any event, the most stable relationships are clearly those involving student, community and home backgrounds, and school demographics.

TABLE 2 SIGNIFICANT CORRELATIONS BETWEEN SCHOOL QUESTIONNAIRE VARIABLES AND ACHIEVEMENT

s+ significant positive correlation, s- significant negative correlation, level of significance .10

Variable	Test	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Community size	Content 13	s+				s+				s+		s+	s+	s+				s+	
	Content 16	s+					s+									s+		s+	s+
	Problem 13		s+						s+	s+		s+				s+		s+	s+
	Problem 16	s+			s+								s+					s+	s+
School size	Content 13			s+					s+		s+							s+	
	Content 16	s+				s+	s+	s+					s+					s+	
	Problem 13		s+						s+							s+			
	Problem 16												s+						
Average math class size	Content 13									s+						s+			
	Content 16	s+						s+					s+			s+			s+
	Problem 13						s+			s+						s+		s+	
	Problem 16		s+										s+			s+			
School governance public/private (Note A)	Content 13	s+	s+							s+									
	Content 16	s+			s+														
	Problem 13		s+		s+				s+	s+									
	Problem 16	s+			s+														
Percentage of students with learning problems	Content 13	s-	s-	s-	s-				s-	s-	s-	s-		s-					
	Content 16	s-			s-		s-									s-			
	Problem 13	s-	s-	s-	s-		s-		s-	s-		s-						s-	
	Problem 16	s-			s-							s-							
Percentage of students from single parent families	Content 13	s-	s-	s-	s-				s-										
	Content 16	s-	s-	s-	s-														s-
	Problem 13		s-	s-	s-			s-	s-										
	Problem 16	s-		s-	s-														
Percentage of students with health or nutrition problems that inhibit learning	Content 13	s-	s-	s-	s-		s-		s-	s-								s-	
	Content 16	s-			s-											s-		s-	s-
	Problem 13	s-	s-	s-	s-		s-		s-				s-					s-	
	Problem 16	s-	s-		s-		s-	s-											
Teacher Assignment (homeroom/specialization) (Note A)	Content 13								s+										
	Content 16																		
	Problem 13				s+	s+			s+			s+	s+					s+	
	Problem 16																		
Capacity to provide instruction limited by lack of parental support	Content 13	s-	s-							s-						s-			
	Content 16	s-			s-														
	Problem 13	s-	s-	s-	s-		s-		s-				s-					s-	
	Problem 16	s-		s-	s-		s-											s-	

Note A: Categorical variable, analysis by comparison of means

Shaded areas represent missing data or insufficient data for analysis. School identifiers were missing from student questionnaires for Prince Edward Island; therefore, correlations could not be computed.

TABLE 2 SIGNIFICANT CORRELATIONS BETWEEN SCHOOL QUESTIONNAIRE VARIABLES AND ACHIEVEMENT (CONTINUED)

s+ significant positive correlation, s- significant negative correlation, level of significance .10

Variable	Test	BC	AB	SK	MBe	MBf	ONe	ONf	QCe	QCf	NBe	NBf	NSe	NSf	PE	NL	NU	NT	YT
Capacity to provide instruction limited by range of student abilities	Content 13	s-	s-	s-	s-					s-	s-							s-	s-
	Content 16	s-			s-	s-	s-									s-		s-	s-
	Problem 13	s-	s-	s-	s-		s-		s-		s-		s-	s-				s-	
	Problem 16	s-			s-								s-				s-		
Capacity to provide instruction limited by students' home backgrounds	Content 13	s-	s-							s-									s-
	Content 16	s-			s-		s-												s-
	Problem 13	s-	s-	s-	s-		s-		s-	s-								s-	
	Problem 16	s-		s-	s-		s-						s-						
Capacity to provide instruction limited by community conditions (e.g., language, migration)	Content 13		s-		s-					s-									s-
	Content 16				s-	s-											s-		s-
	Problem 13	s-	s-		s-				s-				s-					s-	
	Problem 16	s-			s-		s-										s-		

Note A: Categorical variable, analysis by comparison of means

Shaded areas represent missing data or insufficient data for analysis. School identifiers were missing from student questionnaires for Prince Edward Island; therefore, correlations could not be computed.

CONCLUSIONS

This report examines some of the highlights of the data gathered from principal, teacher, and student questionnaires covering a great variety of variables that might be expected to be associated with mathematics achievement.

The first three sections give summaries of questionnaire response across the various SAIP populations. This descriptive/comparative approach serves to highlight how the context of learning differs among the various educational jurisdictions across the country in a way that might be useful for policy analysis. Differences between the two official language groups are also highlighted as an adjunct to the cross-jurisdiction analysis because SAIP has identified separate populations for the two language groups in several jurisdictions. Additionally, age differences could be identified for the student questionnaires because the student populations were separated by age. Other interesting breakdowns, such as by gender or socio-economic status, were not pursued here as they did not fall directly out of the population definitions.

The fourth section presents an exploratory analysis of bivariate relationships between questionnaire responses and student achievement for the student and school questionnaires. The teacher questionnaire was excluded from this analysis because of difficulties in matching teacher responses to the achievement of students taught by an individual teacher. Although results have been presented by jurisdictions, the emphasis in this analysis is not on comparison between jurisdictions but on finding relationships that are reasonably stable across jurisdictions.

The exploratory nature of this analysis is emphasized. In reality, achievement is influenced by a large number of factors, many of which are themselves interrelated. A more comprehensive analysis is required to fully investigate these interrelationships, the possible cumulative effects of the various factors, and the possibility that some factors may function differently in different jurisdictions.

The following are highlights of the major results:

Schools

- As might be expected, the types of school community reflect provincial populations, with more schools in larger provinces being located in cities and in smaller provinces in rural areas and small towns. School sizes show a more varied pattern across jurisdictions. Schools in the Western provinces and the territories tend to be more closely community-based, as evidenced by larger proportions of students living within walking distance of the school and fewer students travelling by bus.

- The proportion of students speaking a different language at home is much larger in minority-language schools than majority-language schools. This crossing of official language groups is more prevalent than the existence of immigrant language groups as a source of language difference between school and home. Nevertheless, anglophone schools in Ontario and British Columbia have substantial numbers of non-English-speaking students. A similar situation exists for the territories where many students use Aboriginal languages at home. Indeed, the reported incidence of students having a first language other than the language of the school is higher in Nunavut than in any other jurisdiction.

- Average class size tends to be in the 20–25 range but varies substantially across jurisdictions. Minority-language schools tend to have smaller classes than those of the majority language.

- Mathematics teaching is more differentiated for 16-year-olds than for 13-year-olds, with more teacher specialization, more semestering, and more streaming. A majority of both principals and teachers support streaming for high school students.

- Decisions on teacher hiring are influenced mainly by districts and principals, with the relative influence of each varying considerably by jurisdiction. Decisions on choice of textbooks are influenced mainly by the province in Eastern Canada and by internal school sources in Central and Western Canada. Other areas of decision making, such as discipline, course offerings, and absenteeism were influenced primarily from within the school.

- Levels of parental involvement in aspects of school life were generally reported by principals as low, with some variations across jurisdictions and languages. Community conditions, lack of parental support, student ability and home background are more prevalent as factors limiting instruction in francophone schools and those in the territories than in other anglophone schools.

- It was not possible to obtain a good measure of the number of computers in schools because the questionnaire ranges were too broad. However, wide variations by jurisdiction and language

were reported in the availability of dedicated computer rooms where mathematics could be scheduled. Such facilities are much more likely to be found in anglophone than in francophone schools. There are also substantial variations in the availability of computers in mathematics classrooms.

- The number of days in the school year varies from 178 in the Yukon to 197 in Saskatchewan. There is a slight tendency toward longer school years in Western provinces. The Atlantic provinces and the territories also reported more days lost in the school year due to weather and other sources of school closings, further reducing the time available for instruction. The number of days available for teacher professional development varies from a low of 3 or 4 in several jurisdictions to 20 in Quebec.

- Most schools reported that they provide extra teaching support for students struggling with mathematics. The numbers providing enrichment for gifted students are smaller and more variable across jurisdictions. Manitoba and Nova Scotia francophone schools stood out as providing less support in both categories.

Teachers

- Generally, there are slightly more male than female mathematics teachers, with relatively small variations across jurisdictions. Quebec stands out as having more female mathematics teachers and Nova Scotia francophone as having more male teachers. Most teachers tend to be in mid-career, with those in Quebec anglophone, Nova Scotia Anglophone, and Newfoundland and Labrador schools standing out as having substantially more experience and those in the territories less experience than teachers elsewhere.

- Almost all teachers hold university degrees, with the B.Ed. being most common. The proportion of teachers specialized in mathematics, as evidenced by a degree majoring in this area, varies widely across jurisdictions, with higher proportions in francophone jurisdictions and in Newfoundland and Labrador than in other provinces. Relatively few teachers, less than 20% in most jurisdictions, hold master's degrees.

- Teachers reported a median of just over 20 hours per week of scheduled teaching time. This time is lowest in Quebec (both English and French) and highest in Nunavut. This time was added to times spent on a variety of out-of-class activities to yield an estimated weekly workload of about 50 hours. Preparation and marking were the most frequent out-of-class activities. Teachers reported a median of about three hours scheduled preparation time per week, with Quebec anglophone teachers standing out with a median of seven hours.

- The level of involvement of teachers with parents is not particularly high and is again characterized by wide variations across jurisdictions. Teachers in anglophone jurisdictions tend to have greater contact with parents than their francophone counterparts. The main source of contact was reported to be parent-teacher interviews.

- About half the teachers reported meeting once a month or more with colleagues for planning. Except for Quebec, this occurs more often for anglophone than francophone teachers. Beyond this, teacher lesson planning seems generally to be characterized most strongly by working alone with the teacher's own previously prepared materials and textbooks. Other text or resource materials are used relatively rarely. The use of provincial curriculum guides is less prevalent in Quebec than elsewhere.

- Computers and the Internet are not in common use as lesson preparation tools, with only about 10% of teachers reporting frequent use.

- There is general agreement between teacher and student reports on classroom activities. The most common activities reported by teachers are teaching problem-solving strategies, diagnosis and correction of individual student problems, and working on assigned exercises from textbooks, workbooks, or worksheets. There is a tendency for francophone teachers to work less with individual students than anglophone teachers. The use of mathematics books and magazines was found to vary widely between language groups, with anglophone teachers and students both reporting much less use than their francophone counterparts.

- There is relatively little use of computers in mathematics teaching. The use of manipulative materials varies widely, as does the use of graphing calculators. However, regular calculators are extensively used throughout.

- Questioning is a highly prevalent classroom activity throughout, with the most common form being teacher questions requiring brief responses.

- Most teachers reported that the range of student abilities presents a major challenge to teaching. However, fewer teachers consider the range of student backgrounds to be a major challenge. The latter are considered as a challenge less often by francophone than by anglophone teachers and more often by territorial teachers than by others. Disruptive students and special-needs students are generally considered a challenge more often by francophone than by anglophone teachers

and more often by teachers in the territories than elsewhere. Finally, low school morale is seen as a challenge more often by francophone than by anglophone teachers.

- Substantial language differences are found in the relative weights given to various factors contributing to student grades. Francophone teachers tend to give less weight to multiple-choice and similar items and more weight to short-answer and essay items than anglophone teachers. Francophone teachers and those in Nunavut also give considerably more weight to class attendance and improvement over the year.

- Almost all teachers agree that calculators should be used in mathematics teaching only after students have mastered the basic skills.

- There is almost universal agreement among teachers that mathematics is primarily a deductive system and a system for solving problems. There is also general disagreement that mathematics is primarily a computational system.

- There are distinct language differences in the proportions of teachers agreeing that students need to work hard in order to do well in mathematics courses, with anglophone teachers being much more likely to support this proposition. Although few teachers overall agree that natural talent is needed to do well in mathematics courses, the support for this theory was also higher among anglophone than francophone teachers.

- Opportunity-to-learn ratings for mathematics content present a complex pattern. The results tend to be consistent with a progression in learning from the age of 13 to the age of 16, as expected by the SAIP framework. Overall differences (combining previous years with current year teaching) are not as great as expected, suggesting that the SAIP mathematics framework is closer to the 13-year-old than the 16-year-old level. Jurisdictional differences are somewhat larger for 13-year-olds than 16-year-olds, suggesting that the sequence in which content is taught varies.

Students

- The percentage of students born outside of Canada is quite small in most jurisdictions, averaging less than 5%. These proportions are higher for the larger provinces than for the smaller provinces.

- Generally, more parents of students in the Atlantic region and Nunavut have less than a high school education than those elsewhere. In particular, a greater proportion of fathers in these jurisdictions were reported as having less than high school completion. The picture for parents as university graduates is more mixed, with no clear geographical or language pattern and little difference between the proportions of fathers and mothers in this category.

- A large majority of students in all jurisdictions reported having a computer in their home, with the figures in the 80% to 90% range in most jurisdictions. The proportions reporting having Internet connections are smaller, but followed the same pattern as for computer possession. Nunavut is a notable exception, with only about 50% of students having computers and about 30% having Internet connections.

- Students have very high educational aspirations, with more than 90% indicating that they intend to continue their education beyond high school, and with little variation across jurisdictions. The most common projected postsecondary destination among 16-year-olds is university or college rather than trade or technical institutions.

- A high proportion of students agree that mathematics is important for their future studies, with higher proportions of 13-year-olds than 16-year-olds holding this view. About 50% of 16-year-olds plan careers in fields related to mathematics, with relatively small variations across jurisdictions. The most common fields reported are accounting, business, and health, followed by engineering, computer studies, and the pure sciences. Science or mathematics teaching was reported as a career destination by less than 2% of students overall.

- Most students agree that their parents, teachers, and friends as well as themselves think it is important for them to do well in school. These proportions drop for the importance of doing well in mathematics, but remain relatively high throughout. Age differences are evident here, particularly for the importance of mathematics, with more 13-year-olds than 16-year-olds believing that it is important to do well in mathematics.

- Almost all students agree that to do well in mathematics you need hard work and good teaching. However, students, especially 16-year-olds, are much more likely than teachers to indicate that natural ability is required for success in mathematics. Students strongly attribute high marks to working hard and low marks to not working hard enough. As for quality of teaching, more students attribute high marks to good teaching than low marks to poor teaching. Francophone students outside Quebec and students in Nunavut are more likely than others to attribute high or low marks to luck.

- Students use computers much more often for entertainment than for school work. Few students use computers specifically for mathematics, but about half use computers in other areas of school work.

- Students hold generally positive views about the quality of school life. However, there are large language differences in responses to certain propositions in this area. Francophone students are much more likely to agree that they are bossed around too much in school, but less likely to agree that there is not much interesting to do in school.

- Most students discuss their future with their parents a few times a month or more. This proportion is higher for 16-year-olds than for 13-year-olds. The opposite pattern is observed for working with parents on mathematics homework, where this activity was reported by many more 13-year-olds than 16-year-olds.

- Finally, it is worth noting that, although an item-by-item comparison of these results with those found in the 1999 science assessment was not presented, most of the general response patterns are similar in the two assessments. In particular, the reported regional and language differences tend to be the same for both assessments. It would be useful to conduct more detailed comparisons in future assessments, particularly in subsequent cycles in the same subject, as this would allow trends over time, free from subject confounding, to be discerned.

Context Factors and Achievement: Student

- As expected, higher achievement is associated with higher socio-economic status and with higher educational aspirations. In particular, 16-year-old students aspiring to attend university do better than those aspiring to other forms of postsecondary education. Students planning careers in mathematics do better than those who do not.

- Time spent on mathematics homework is positively associated with achievement. However, taking tutoring and having parents help with homework show negative associations. While this no doubt reflects the fact that students doing poorly would more likely receive either tutoring or parent help, the results suggest that neither of these activities is likely to have "turn-around" effects on achievement.

- Positive attitudes toward school and mathematics and internal motivation show positive associations with achievement while the opposite is true for negative attitudes and external motivation. Attitudes are also associated with absence rate which, in turn, shows a negative relationship with achievement.

- In general, classroom activities and use of resources that indicate a structured approach to teaching (e.g., working on textbook exercises, teacher showing students how to do problems, assigning homework) show more positive results than those reflecting more informal teaching (e.g., working on projects, discussing things other than the topic of the lesson, use of guest speakers).

- Calculator use shows positive associations and computer use shows negative associations with achievement.

Context Factors and Achievement: School

- Community size and school size are positively correlated with each other, and both are positively associated with achievement.

- Contrary to the usual expectation, larger class size tends to be associated with higher achievement. However, class size is also associated with school size, suggesting that the positive effects of being in larger schools may offset any positive effects of having smaller classes in smaller schools. All of this is likely linked in complex ways to socio-economic status of the school, language, and other community or school variables.

- In most jurisdictions with sufficient private schools to permit analysis, students in private schools perform better than those in public schools. Ontario (English) was an exception in showing no significant differences. Again, these results are likely related in complex ways to socio-economic status and other selection factors that require further analysis.

- A variety of student background variables (e.g., proportion of students with learning problems, from single-parent families, and with health or nutrition problems) are associated with achievement in a way consistent with the broader results for socio-economic status.

- Student background factors identified by principals as limiting instruction (e.g., range of student ability, lack of parental support) are negatively associated with achievement. However, inadequacy of school resources tended not to show similar relationships.

- Generally speaking, factors related to school policies and the locus of school decision making do not show significant relationships with achievement.

APPENDIX A: Framework for the Questionnaires

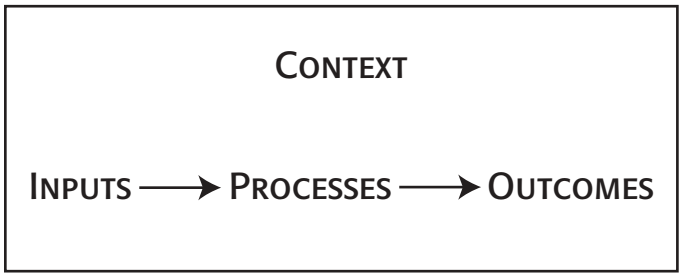
Conceptual Framework

It is obvious that learning is a complex process and that the achievement of an individual student or group of students is influenced by an enormous number of variables. While some of the important influences on achievement are related to ability and socio-economic status, which are beyond the control of the school, it is also generally acknowledged that variations in educational policies and practices can also influence learning. Some of the variables affecting learning could be expected to be more important for policy, more amenable to change, or more efficient as ways of enhancing learning than others. Improving learning can be expected to require intervention at the level of the individual student, the classroom, the school, or the jurisdiction. Some ways of improving learning might require enormous outlays of resources while others might be accomplished relatively easily.

Most educational indicator systems are built around the fairly straightforward concept that student learning **outcomes** are influenced by **inputs** and by the **processes** engendered by these inputs. It is also generally recognized that education operates in an overall **context** determined by demographic features, social and economic conditions, infrastructure, and other broad characteristics of the society in which the enterprise operates. This type of model is depicted in Figure 1.

Input-Process-Outcome Model in Context

FIGURE 1



In a program such as SAIP, the outcomes are clearly defined as the results on the achievement measures, but the model in itself does not tell us what specific context, input, or process variables are most worth investigating. Some elaboration of the model is required if it is to be of any use in determining what variables should be included in studies of the factors influencing achievement. Most of the variables included in comprehensive surveys have some plausible basis in previous research, or may be justified by their policy relevance. Perhaps the best example of this is the synthesis work of Herbert Walberg and his colleagues, which has taken place over more than a decade and which has appeared in the literature in various forms. The particular version to be discussed here appears in three major articles by Wang, Haertel and Walberg (1990, 1993, 1994).

In a 1993 paper, Wang, Haertel and Walberg synthesized the results of more than 200 research reviews encompassing thousands of individual studies. They identified 228 variables shown to be associated with learning. These, in turn, were organized into 30 scales under six broad categories. These categories, in turn, were organized on a continuum based on how closely the variable touched on the lives of teachers and students in the classroom.

In general, the results supported the hypothesis that variables closest to the home and classroom are more strongly associated with learning than those that are further removed. The order of influence of the six main categories was:

1. Program Design (e.g., curriculum and instruction)
2. Out-of-School Contextual Variables (e.g., home environment, out-of-school use of time)
3. Classroom Instruction and Climate (e.g., classroom management)
4. Student Variables (e.g., motivation, placement)
5. School-Level Variables (e.g., parent involvement policy)
6. State and District Variables (e.g., state level policy)

Questionnaire Specifications

An initial table of specifications for the questionnaires was developed from the Wang, Haertel and Walberg synthesis, an initial analysis of policy issues in the Canadian context, and an examination of the frameworks for several other large-scale studies. These included earlier SAIP questionnaires, the Third International Mathematics and Science Study (TIMSS), the National Longitudinal Survey of Children and Youth (NLSCY) being conducted by Statistics Canada, and early drafts of a framework for questionnaires for the OECD Programme for International Student Assessment (PISA). This table was organized along the lines of the six main categories of the Wang, Haertel and Walberg synthesis, plus a "teacher" level that captures certain policy-relevant issues, such as teacher qualifications, which are present in other formulations but absent as a main category in Wang, Haertel and Walberg.

1. Jurisdictional/District Context
   - 1.1 Administrative autonomy
   - 1.2 Bureaucratic structure
   - 1.3 District size
   - 1.4 Control of curriculum
   - 1.5 Resource allocation
   - 1.6 External testing

2. Out-of-School Context
   - 2.1 Community type
   - 2.2 Community support of school
   - 2.3 Home environment
   - 2.4 Parental support
   - 2.5 Peer group
   - 2.6 Out-of-school use of time
   - 2.7 Parent education
   - 2.8 Home language

3. School
   - 3.1 School structure
   - 3.2 School size
   - 3.3 Leadership style
   - 3.4 School improvement effort
   - 3.5 Staff morale/collaboration
   - 3.6 Discipline policy
   - 3.7 Evaluation policy
   - 3.8 Resources
   - 3.9 Staff deployment
   - 3.10 Parent involvement
   - 3.11 Program differentiation

4. Student
   - 4.1 Prior performance
   - 4.2 Aspirations
   - 4.3 Performance expectations
   - 4.4 Attributions of success/failure
   - 4.5 Importance of mathematics
   - 4.6 Liking for school
   - 4.7 Liking for mathematics
   - 4.8 Learning strategies (metacognition)
   - 4.9 Time on task
   - 4.10 Peer interaction
   - 4.11 Behaviour
   - 4.12 Absenteeism
   - 4.13 Stream

5. Program Design
   - 5.1 Curriculum prescription
   - 5.2 Curriculum support
   - 5.3 Implemented curriculum
   - 5.4 Opportunity to learn
   - 5.5 Teacher-designed material
   - 5.6 Lesson planning
   - 5.7 Materials selection and use

6. Teacher
   - 6.1 Basic teacher qualifications
   - 6.2 Teacher specialization
   - 6.3 Experience
   - 6.4 Professional development
   - 6.5 Confidence
   - 6.6 Attributions of responsibility
   - 6.7 Professional status
   - 6.8 Requirements for mathematics teaching
   - 6.9 Nature of mathematics and mathematics teaching
   - 6.10 Pedagogical beliefs

7. Classroom Instruction and Climate
   - 7.1 Classroom routines
   - 7.2 Direct instruction
   - 7.3 Grouping
   - 7.4 Active participation
   - 7.5 Laboratory activities (computer labs, manipulatives, etc.) in mathematics
   - 7.6 Seatwork
   - 7.7 Monitoring/piloting
   - 7.8 Total scheduled time
   - 7.9 Instructional time lost
   - 7.10 Disruptive behaviour
   - 7.11 Recitation
   - 7.12 Classroom climate
   - 7.13 Homework

Development Procedures

The initial drafts of the three 1999 SAIP science questionnaires were produced directly from the table of specifications. Many items were adapted from previous studies. Other items were constructed specifically to fit the table of specifications. This draft was reviewed in detail by the members of the SAIP developmental consortium. The draft teacher questionnaire was also reviewed by approximately 20 teachers. The draft student questionnaire was subjected to a field trial in one province, using 24 classes with a total of 535 students.

All of the information from the reviews and field trials was used to produce a second draft. After one further review by the developmental consortium, the new draft was submitted to the various jurisdictions, through the SAIP coordinators in each jurisdiction. This was a crucial stage in the process because individual provinces and territories had final authority over whether or not the instruments would be administered in schools within their jurisdiction.

The Canadian Teachers' Federation (CTF) was asked to provide input concerning the structure and content of the science questionnaires.

These reviews resulted in extensive modifications to the questionnaires. The most significant changes involved items on student socio-economic status and family circumstances, teacher background, and school climate. Nevertheless, core items on student socio-economic status (parents' education and occupations) and on teacher qualifications and experience were retained. Items on the school questionnaire on behaviour problems were removed. However, it was possible to retain more general items on school climate, such as levels of responsibility for various activities, the role of parents, and the existence of policies on discipline, homework, and similar matters.

Only minor modifications to the original science questionnaires were made in adapting these for the mathematics assessment. All specific references to science were changed to mathematics, and questions were altered where necessary to reflect differences in instruction in the two areas. The major single change involved an extensive set of "opportunity to learn" questions in the teacher questionnaire. In this case, all of the original science content statements had to be changed to appropriate mathematics statements, based on the SAIP mathematics framework. The question stimulus was also clarified to remove ambiguity that had become evident from responses to the science questionnaire.

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APPENDIX B: Cross-Tabulation of Student Questionnaire Variables with Achievement

TABLE B1: PERCENTAGE AT OR ABOVE CRITERION BY MOTHER'S EDUCATION

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	< high school	38	22	35	10	38	18	24	3
	High school	39	31	39	9	45	19	39	12
	Postsecondary	44	27	38	15	45	24	35	14
	University degree	32	39	49	16	43	36	37	20
	Total	38	31	41	13	44	26	35	14
AB	< high school	47	22	37	9	49	22	39	24
	High school	44	28	37	24	45	26	36	21
	Postsecondary	40	39	51	18	47	42	43	23
	University degree	31	52	39	32	44	47	41	33
	Total	38	39	42	23	45	38	40	26
SK	< high school	32	10	16	2	58	11	25	6
	High school	37	19	38	8	44	14	36	11
	Postsecondary	38	25	45	9	54	23	39	13
	University degree	40	31	36	14	50	31	42	17
	Total	38	23	37	9	50	21	37	13
MBe	< high school	31	15	36	6	34	18	28	7
	High school	38	21	43	8	47	25	39	13
	Postsecondary	42	27	47	12	43	28	42	16
	University degree	37	33	43	27	38	34	34	28
	Total	38	26	43	14	41	27	36	16
MBf	< high school	45	27	43	5	64	14	34	3
	High school	38	13	52	16	40	30	43	16
	Postsecondary	49	28	56	13	36	41	39	18
	University degree	39	36	59	17	42	42	55	24
	Total	42	28	55	15	41	37	45	18
ONe	< high school	32	17	31	8	42	21	28	9
	High school	43	24	38	12	51	19	45	7
	Postsecondary	45	26	50	9	49	29	33	19
	University degree	36	40	47	19	49	34	32	27
	Total	40	30	44	13	49	28	34	18
ONf	< high school	35	12	36	8	46	25	25	5
	High school	31	26	36	3	45	32	32	7
	Postsecondary	39	28	46	6	35	44	41	11
	University degree	36	42	48	13	52	29	37	20
	Total	36	30	42	7	45	33	35	12
QCe	< high school	52	12			35	28		
	High school	40	28			43	21		
	Postsecondary	33	45			43	36		
	University degree	27	53			42	43		
	Total	34	42			42	34		
QCf	< high school	48	29			46	22		
	High school	42	38			45	32		
	Postsecondary	32	52			47	39		
	University degree	26	64			44	39		
	Total	36	47			46	34		

Table B1: Percentage at or above criterion by mother's education (continued)

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
NBe	< high school	37	15	25		23	16	23	5
	High school	37	17	36	7	49	13	33	8
	Postsecondary	40	27	38	11	45	23	36	16
	University degree	39	35	46	14	42	28	33	18
	Total	38	25	38	10	43	21	33	12
NBf	< high school	30	13	30	5	38	21	37	7
	High school	42	24	44	8	41	29	38	15
	Postsecondary	37	44	52	10	41	40	45	25
	University degree	34	46	64	14	41	39	33	33
	Total	36	30	46	9	41	33	39	20
NSe	< high school	38	6	33	2	34	6	23	3
	High school	42	7	39	6	42	18	33	10
	Postsecondary	42	13	40	11	48	12	38	12
	University degree	41	25	45	14	42	25	32	23
	Total	41	13	40	9	43	16	32	12
NSf	< high school	23		22		38	25	14	
	High school	20	40	56	11	33	22	33	11
	Postsecondary	38	14	52	9	50	29	64	
	University degree	42	25	44	24	50	19	58	11
	Total	33	21	45	14	45	23	48	7
PE	< high school	42	10	14		35	15	21	6
	High school	44	11	41	4	38	13	33	7
	Postsecondary	48	20	46	6	40	20	38	11
	University degree	47	17	48	12	42	23	35	13
	Total	46	16	41	7	39	19	33	10
NL	< high school	28	16	21	1	47	16	26	4
	High school	43	24	30	1	33	23	38	10
	Postsecondary	43	30	41	11	43	35	31	14
	University degree	48	25	59	10	45	34	34	17
	Total	41	25	35	5	41	28	32	11
NU	< high school	7		15					
	High school	17						50	
	Postsecondary		31	11		20			
	University degree	29	57	50	38	25		50	50
	Total	9	12	19	6	7		12	6
NT	< high school	23		21		6	11	24	6
	High school	46	12	35	10	40	7	14	
	Postsecondary	36	25	42	11	22	19		13
	University degree	32	40	45	23	38	19	30	20
	Total	35	20	36	10	30	14	18	12
YT	< high school	22	9	23	15	54	8	36	
	High school	50	12	45	9	73	7	30	5
	Postsecondary	38	30	38	13	48	18	16	13
	University degree	53	26	53	13	53	24	28	21
	Total	42	21	43	12	55	17	25	12

TABLE B2: PERCENTAGE AT OR ABOVE CRITERION BY FREQUENCY OF SPEAKING THE LANGUAGE OF THE TEST AT HOME

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	Always or nearly always	38	25	38	9	42	22	34	13
	Sometimes or never	29	35	42	19	38	32	26	15
	Total	37	26	39	11	41	24	33	13
AB	Always or nearly always	41	33	43	20	46	33	40	22
	Sometimes or never	27	43	28	22	43	36	21	32
	Total	39	34	42	20	46	33	38	23
SK	Always or nearly always	36	18	36	8	47	17	36	12
	Sometimes or never	30	25	42	6	43	19	28	7
	Total	36	19	36	8	47	17	35	12
MBe	Always or nearly always	38	23	40	13	40	24	34	15
	Sometimes or never	33	15	41	4	44	18	44	17
	Total	38	23	40	12	40	23	35	16
MBf	Always or nearly always	30	33	48	10	47	33	43	20
	Sometimes or never	37	23	51	15	43	28	42	17
	Total	36	24	51	14	43	29	43	17
ONe	Always or nearly always	40	27	41	11	47	26	33	15
	Sometimes or never	34	25	45	13	39	27	33	19
	Total	39	27	41	11	46	27	33	16
ONf	Always or nearly always	30	30	37	7	45	30	33	9
	Sometimes or never	35	21	41	4	47	25	30	11
	Total	33	25	39	6	46	27	31	10
QCe	Always or nearly always	32	36			41	32		
	Sometimes or never	34	38			40	22		
	Total	32	36			41	29		
QCf	Always or nearly always	37	42			45	33		
	Sometimes or never	39	36			45	18		
	Total	37	41			45	31		
NBe	Always or nearly always	35	20	37	8	43	19	32	12
	Sometimes or never	19	19	41	6	33	12	20	6
	Total	35	20	37	8	42	19	31	12
NBf	Always or nearly always	34	26	46	8	40	29	40	19
	Sometimes or never	39	18	34	6	41	18	25	16
	Total	35	24	45	8	40	27	38	19
NSe	Always or nearly always	38	13	38	8	40	15	31	11
	Sometimes or never	28	6	40		40	5	12	23
	Total	38	13	38	8	40	15	30	12
NSf	Always or nearly always	25	21	45	5	42	16	37	7
	Sometimes or never	32	15	36	16	43	16	48	6
	Total	29	17	40	11	43	16	43	7
PE	Always or nearly always	44	13	39	7	39	17	33	9
	Sometimes or never	44	11	40		27	9	23	2
	Total	44	13	39	6	39	17	32	8
NL	Always or nearly always	39	23	34	4	40	24	30	11
	Sometimes or never	14	14	25		10	10	17	
	Total	38	23	34	4	40	24	30	11
NU	Always or nearly always	13	10	20	7	10	3	13	7
	Sometimes or never	2	1	3					
	Total	8	5	13	4	3	1	7	4
NT	Always or nearly always	28	17	32	9	30	9	18	7
	Sometimes or never	15	15	13		10	7		
	Total	27	17	30	8	27	9	16	6
YT	Always or nearly always	35	19	39	10	50	14	21	11
	Sometimes or never	33	17	38	6	57	24	40	7
	Total	35	19	38	9	51	15	24	10

Table B3: Percentage at or above criterion by type of postsecondary education planned

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	Non-university	41	23	38	5	41	25	28	8
	University	37	29	41	14	43	28	38	17
	Total	38	29	41	12	43	27	36	15
AB	Non-university	39	28	45	12	41	23	37	15
	University	39	40	44	26	48	38	40	28
	Total	39	38	44	23	47	36	40	26
SK	Non-university	32	24	36	8	51	13	32	8
	University	39	20	39	9	52	20	42	15
	Total	39	21	38	9	52	18	40	13
MBe	Non-university	35	19	39	6	38	24	25	7
	University	39	26	42	16	43	27	37	20
	Total	38	25	42	15	42	27	36	18
MBf	Non-university	56	12	59	14	50	21	38	29
	University	36	27	51	15	43	34	45	19
	Total	38	26	52	15	43	33	44	20
ONe	Non-university	48	8	35	2	42	24	24	6
	University	41	31	45	13	47	29	35	18
	Total	41	29	44	12	46	29	34	18
ONf	Non-university	43	14	39	4	42	32	27	14
	University	37	28	40	7	50	28	33	12
	Total	38	26	40	6	50	28	33	12
QCe	Non-university	45	38			44	15		
	University	28	43			42	33		
	Total	30	42			42	31		
QCf	Non-university	35	43			46	31		
	University	37	48			47	36		
	Total	36	47			47	35		
NBe	Non-university	27	18	34	3	27	17	19	8
	University	38	22	40	11	46	21	37	15
	Total	37	22	39	9	44	21	34	14
NBf	Non-university	24	27	39		47	31	41	13
	University	39	28	48	10	44	27	39	22
	Total	38	28	47	9	44	28	40	21
NSe	Non-university	32	18	33	5	38	9	23	5
	University	39	14	43	10	44	17	34	16
	Total	39	14	41	9	43	16	32	14
NSf	Non-university	31	15	71		50		50	50
	University	35	19	38	14	44	20	51	5
	Total	35	19	41	13	44	19	51	7
PE	Non-university	36	15	22	5	45	24	18	2
	University	45	15	43	8	37	20	35	11
	Total	44	15	41	8	37	20	34	10
NL	Non-university	31	22	28	5	38	18	18	8
	University	41	28	40	5	42	31	35	14
	Total	39	27	37	5	41	29	32	13
NU	Non-university	8	8						
	University	10	11	26	9	9		11	6
	Total	9	10	24	9	8		11	5
NT	Non-university	30	5	36	2	19	13	12	
	University	30	20	31	12	28	12	22	11
	Total	30	19	32	10	27	12	20	9
YT	Non-university	39	6	35		29	7	27	
	University	37	23	44	14	56	15	27	14
	Total	37	21	43	12	53	14	27	12

Table B4: Percentage at or above criterion by intent to work in a field requiring education in mathematics

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	No	36	18	32	5	36	15	29	6
	Yes	36	34	45	19	45	27	38	22
	Total	36	28	39	12	42	23	33	14
AB	No	49	20	46	7	49	22	35	13
	Yes	34	49	42	36	43	41	37	37
	Total	39	38	44	22	45	34	36	25
SK	No	35	8	29	3	46	9	27	5
	Yes	40	25	42	13	52	24	43	19
	Total	38	18	36	8	50	18	36	13
MBe	No	33	17	36	7	39	14	34	7
	Yes	41	26	44	20	43	30	39	22
	Total	39	23	40	14	42	25	37	16
MBf	No	35	22	46	7	53	16	40	8
	Yes	36	28	52	25	35	39	45	26
	Total	36	26	49	16	42	30	43	16
ONe	No	34	16	40	6	41	15	28	8
	Yes	41	33	47	18	49	31	38	23
	Total	39	29	44	13	47	27	34	17
ONf	No	30	19	33	1	48	23	19	6
	Yes	35	28	48	12	46	30	43	16
	Total	33	25	40	6	47	28	32	11
QCe	No	31	26			36	22		
	Yes	35	43			41	34		
	Total	34	37			40	31		
QCf	No	44	30			50	24		
	Yes	33	48			42	38		
	Total	37	41			45	32		
NBe	No	32	11	30	3	38	13	27	7
	Yes	35	27	44	14	45	21	40	20
	Total	34	22	38	9	42	19	34	15
NBf	No	30	18	32	4	39	13	37	8
	Yes	32	31	56	13	40	35	43	29
	Total	31	25	45	9	39	26	40	20
NSe	No	40	7	29	3	41	8	24	5
	Yes	37	16	44	14	44	16	36	21
	Total	38	13	37	9	43	13	30	14
NSf	No	21	3	32	4	38	10	35	5
	Yes	39	29	49	18	46	19	62	8
	Total	31	18	42	12	43	15	50	7
PE	No	43	11	33	1	33	9	24	4
	Yes	46	16	45	15	43	21	41	15
	Total	45	15	39	8	40	18	32	9
NL	No	41	13	24	4	37	14	20	5
	Yes	38	28	41	7	43	30	34	18
	Total	39	23	33	5	41	25	28	13
NU	No	18	12	11				13	
	Yes	5	9	28	12	8			17
	Total	7	9	20	7	6		7	7
NT	No	28	9	31	7	24	2	15	8
	Yes	31	21	35	10	30	15	29	5
	Total	30	17	34	9	28	12	24	6
YT	No	43	4	38	4	47	9	4	11
	Yes	32	30	43	20	54	14	32	8
	Total	35	23	40	12	51	12	22	9

Table B5: Percentage at or above criterion by taking mathematics tutoring

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	no time	38	27	37	11	42	25	31	13
	some time	30	25	42	10	40	20	39	12
	Total	37	26	38	11	41	24	33	13
AB	no time	39	36	40	23	44	35	37	26
	some time	41	25	51	11	54	21	41	14
	Total	39	34	42	20	46	33	38	23
SK	no time	38	20	38	9	48	19	37	12
	some time	25	12	30	6	42	7	29	9
	Total	36	19	36	8	47	17	35	12
MBe	no time	37	25	40	12	42	25	35	16
	some time	36	8	41	12	34	10	34	11
	Total	37	23	40	12	41	23	35	16
MBf	no time	39	27	52	13	46	32	44	17
	some time	31	19	48	14	39	22	40	19
	Total	36	25	51	14	44	29	44	18
ONe	no time	41	28	43	12	46	29	32	16
	some time	33	19	39	10	44	14	35	14
	Total	39	27	42	11	46	26	33	16
ONf	no time	33	29	39	6	46	31	35	10
	some time	33	11	40	4	48	14	16	12
	Total	33	25	39	6	46	28	32	10
QCe	no time	33	40			40	36		
	some time	31	26			44	13		
	Total	32	36			41	30		
QCf	no time	34	48			44	39		
	some time	45	27			48	14		
	Total	38	42			45	31		
NBe	no time	37	25	40	9	45	21	34	13
	some time	31	8	29	5	33	11	22	7
	Total	35	21	37	8	42	19	31	12
NBf	no time	39	30	47	9	41	34	40	20
	some time	30	10	39	2	36	9	28	9
	Total	36	25	45	8	40	28	38	18
NSe	no time	40	14	38	9	42	16	32	13
	some time	30	7	36	5	30	8	23	6
	Total	38	13	37	8	40	15	30	12
NSf	no time	29	20	48	13	40	18	39	10
	some time	28	8	20	7	50	10	56	
	Total	29	18	39	11	43	16	44	7
PE	no time	46	16	42	7	40	18	33	11
	some time	35	4	27	4	32	11	28	2
	Total	44	13	39	6	39	16	32	8
NL	no time	40	27	36	6	42	27	29	11
	some time	30	14	32	2	33	13	31	10
	Total	38	23	35	4	40	24	30	11
NU	no time	11	7	18	2	3	3	13	
	some time	3	3	4	8	3			10
	Total	8	6	14	3	3	1	8	4
NT	no time	31	17	35	10	30	12	16	7
	some time	18	14	24	6	22	2	17	7
	Total	28	16	31	8	28	10	16	7
YT	no time	36	22	34	12	49	19	25	14
	some time	33	9	47	3	60		19	
	Total	35	19	37	10	51	16	24	10

Table B6: Percentage at or above criterion by time on mathematics homework

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	less than 1 hour/week	36	21	31	10	36	23	26	7
	1 hour or more/week	37	31	44	11	47	24	40	17
	Total	37	26	38	11	42	24	34	13
AB	less than 1 hour/week	40	31	37	18	45	27	36	18
	1 hour or more/week	39	37	48	23	47	38	40	27
	Total	39	34	43	20	46	33	38	23
SK	less than 1 hour/week	35	20	38	7	46	20	36	10
	1 hour or more/week	38	18	34	9	49	13	35	13
	Total	36	19	36	8	47	17	36	11
MBe	less than 1 hour/week	36	22	34	9	39	22	34	10
	1 hour or more/week	38	24	47	17	43	24	36	22
	Total	37	23	40	12	41	23	35	16
MBf	less than 1 hour/week	36	22	40	11	43	27	40	16
	1 hour or more/week	37	29	61	16	44	32	45	19
	Total	36	26	51	14	44	29	43	18
ONe	less than 1 hour/week	36	26	33	9	42	24	29	9
	1 hour or more/week	42	27	49	13	49	28	35	21
	Total	40	27	42	11	46	26	33	16
ONf	less than 1 hour/week	34	21	34	3	47	31	25	8
	1 hour or more/week	33	30	44	9	46	24	37	12
	Total	33	26	39	6	47	28	31	10
QCe	less than 1 hour/week	31	35			39	28		
	1 hour or more/week	33	38			43	32		
	Total	32	37			41	30		
QCf	less than 1 hour/week	37	40			43	32		
	1 hour or more/week	38	43			46	31		
	Total	38	41			45	31		
NBe	less than 1 hour/week	35	20	36	7	46	16	27	10
	1 hour or more/week	35	21	40	9	37	23	36	14
	Total	35	20	38	8	42	19	31	12
NBf	less than 1 hour/week	35	25	37	6	35	31	38	14
	1 hour or more/week	39	26	53	9	46	24	40	22
	Total	37	25	45	8	40	28	39	18
NSe	less than 1 hour/week	38	12	33	5	41	12	27	10
	1 hour or more/week	40	14	41	10	38	18	34	13
	Total	39	13	37	8	40	15	30	12
NSf	less than 1 hour/week	23	16	48	10	38	14	33	7
	1 hour or more/week	43	19	34	11	54	19	55	7
	Total	30	17	39	11	43	16	44	7
PE	less than 1 hour/week	44	11	33	4	37	17	28	5
	1 hour or more/week	43	16	46	9	40	15	36	12
	Total	44	13	39	6	38	16	32	9
NL	less than 1 hour/week	39	23	25	5	38	24	29	5
	1 hour or more/week	38	24	41	4	41	24	30	14
	Total	38	23	34	4	40	24	30	11
NU	less than 1 hour/week	10	2	9			2	5	
	1 hour or more/week	5	13	22	9	10		13	13
	Total	8	6	13	3	3	1	7	4
NT	less than 1 hour/week	23	11	29	7	24	6	13	2
	1 hour or more/week	32	22	33	10	33	14	24	16
	Total	28	17	31	8	28	9	17	7
YT	less than 1 hour/week	31	19	34	4	46	21	20	12
	1 hour or more/week	41	20	42	16	54	12	27	8
		36	20	38	10	50	16	24	10

Table B7: Percentage at or above criterion for the statement that mathematics is more difficult than other school subjects

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	disagree	38	36	38	21	42	34	33	23
	agree	36	18	38	6	41	15	34	8
	Total	37	26	38	11	41	24	34	13
AB	disagree	37	46	39	34	41	49	38	31
	agree	41	24	45	11	50	20	38	19
	Total	39	34	43	20	46	33	38	23
SK	disagree	38	29	45	15	52	25	40	20
	agree	33	8	30	3	42	8	32	6
	Total	36	19	36	8	47	17	35	12
MBe	disagree	40	31	37	23	43	34	37	26
	agree	34	15	42	6	39	15	34	9
	Total	37	22	40	12	41	23	35	15
MBf	disagree	40	33	55	24	39	39	43	25
	agree	33	18	47	6	47	20	42	12
	Total	37	25	51	14	43	29	43	18
ONe	disagree	40	37	47	20	45	38	42	26
	agree	38	15	39	6	47	16	28	10
	Total	39	27	42	11	46	26	33	16
ONf	disagree	33	32	45	11	46	36	41	20
	agree	33	17	34	1	45	16	25	4
	Total	33	25	39	6	46	27	31	10
QCe	disagree	26	54			38	45		
	agree	37	24			44	19		
	Total	33	36			41	30		
QCf	disagree	32	52			43	39		
	agree	44	28			47	22		
	Total	38	41			45	31		
NBe	disagree	36	33	45	14	46	30	41	23
	agree	34	10	31	4	40	11	26	5
	Total	35	20	37	8	42	19	31	12
NBf	disagree	40	36	51	12	42	37	40	26
	agree	33	11	37	2	36	16	36	8
	Total	36	25	45	8	39	27	38	18
NSe	disagree	44	21	42	16	44	23	35	20
	agree	34	6	34	2	36	9	28	7
	Total	39	13	37	8	39	15	30	12
NSf	disagree	33	21	40	16	48	23	31	12
	agree	24	11	38	6	33	6	55	3
	Total	30	18	39	11	42	16	44	7
PE	disagree	47	20	47	12	43	25	38	16
	agree	41	7	33	2	35	10	28	3
	Total	44	13	39	7	39	16	32	9
NL	disagree	43	32	42	6	36	35	36	18
	agree	34	15	28	3	42	15	25	6
	Total	38	23	34	4	40	24	30	11
NU	disagree	8	8	17	6		3	7	7
	agree	8	4	9	2	4		8	
	Total	8	6	12	3	3	1	7	4
NT	disagree	27	30	34	13	31	18	16	9
	agree	28	7	28	5	24	4	15	6
	Total	28	16	31	8	27	9	15	7
YT	disagree	41	29	38	23	45	25	32	16
	agree	31	14	38	5	56	8	20	7
	Total	34	19	38	10	51	15	24	10

Table B8: Percentage at or above criterion for the statement that I keep trying until I solve difficult problem (persistence)

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	disagree	39	19	37	4	37	18	31	6
	agree	36	30	39	13	44	27	35	16
	Total	37	26	39	11	42	24	34	13
AB	disagree	39	29	50	12	46	26	36	11
	agree	40	37	40	23	46	36	39	28
	Total	40	34	43	20	46	33	38	23
SK	disagree	37	11	28	3	42	13	27	5
	agree	36	23	39	10	50	19	39	15
	Total	36	19	36	8	47	17	35	12
MBe	disagree	35	18	34	5	42	14	37	11
	agree	38	25	43	15	40	27	34	18
	Total	37	23	40	12	41	23	35	16
MBf	disagree	40	18	43	9	48	19	41	11
	agree	35	29	54	17	40	36	44	22
	Total	37	25	50	14	43	29	43	18
ONe	disagree	40	17	33	7	47	20	27	6
	agree	39	29	44	13	46	29	35	20
	Total	39	26	41	12	46	26	33	16
ONf	disagree	30	14	35	2	47	16	28	4
	agree	34	30	41	8	45	32	34	13
	Total	33	25	40	6	46	27	32	10
QCe	disagree	40	30			44	20		
	agree	30	39			40	33		
	Total	33	37			41	30		
QCf	disagree	42	32			52	22		
	agree	36	46			42	35		
	Total	38	42			45	31		
NBe	disagree	33	11	30	4	39	11	25	5
	agree	36	24	40	10	43	22	35	15
	Total	35	20	37	8	42	18	32	12
NBf	disagree	39	12	37	1	39	16	35	13
	agree	36	28	48	10	40	32	39	20
	Total	37	24	45	8	40	28	38	18
NSe	disagree	34	7	31	2	40	8	24	4
	agree	41	16	39	9	40	18	33	15
	Total	39	13	38	8	40	15	30	12
NSf	disagree	26	16	31	3	29	18	48	5
	agree	31	18	43	15	53	14	42	8
	Total	29	17	39	11	42	16	44	7
PE	disagree	48	6	31	2	37	8	23	3
	agree	42	16	42	9	39	20	36	11
	Total	44	13	39	7	39	16	32	9
NL	disagree	39	17	23	1	39	21	26	6
	agree	39	26	40	5	40	25	31	13
	Total	39	23	35	4	39	24	30	11
NU	disagree	18	5	6					
	agree	5	6	14	4	3	2	9	4
	Total	8	6	13	3	3	1	8	4
NT	disagree	34	9	44	4	28	6	6	
	agree	26	19	28	10	27	10	19	9
	Total	28	16	31	8	27	9	16	8
YT	disagree	42	13	25	2	44	17	15	6
	agree	29	23	43	13	52	16	27	12
	Total	33	20	38	10	50	16	24	10

Table B9: Percentage at or above criterion by attribution of low marks in mathematics to bad luck

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	disagree	37	27	39	12	43	24	36	14
	agree	39	22	37	7	33	20	21	9
	Total	37	26	38	11	42	24	34	13
AB	disagree	41	34	43	21	47	33	38	22
	agree	33	35	41	16	41	32	36	26
	Total	39	34	42	20	46	33	38	23
SK	disagree	37	20	37	8	48	18	37	12
	agree	32	17	32	9	41	15	26	12
	Total	36	20	36	8	47	18	35	12
MBe	disagree	39	24	43	13	41	24	37	15
	agree	32	15	29	10	37	19	24	16
	Total	38	23	40	13	41	23	35	15
MBf	disagree	35	26	54	14	44	30	44	21
	agree	39	21	41	16	41	23	40	8
	Total	36	24	50	14	43	28	43	18
ONe	disagree	39	28	43	12	46	27	34	17
	agree	41	21	36	10	47	26	28	9
	Total	39	27	42	11	46	27	33	16
ONf	disagree	36	28	40	6	46	29	32	11
	agree	26	18	38	4	46	20	30	8
	Total	33	25	40	6	46	27	32	10
QCe	disagree	35	37			43	30		
	agree	20	39			32	33		
	Total	33	37			41	30		
QCf	disagree	38	43			46	33		
	agree	35	33			41	22		
	Total	37	42			45	31		
NBe	disagree	35	23	39	9	42	19	34	12
	agree	36	12	31	5	43	15	24	13
	Total	35	21	37	8	42	18	32	12
NBf	disagree	36	27	49	8	43	29	38	19
	agree	36	16	36	7	29	24	39	16
	Total	36	24	45	8	40	28	38	18
NSe	disagree	40	13	38	8	40	15	32	12
	agree	33	12	37	8	36	12	21	10
	Total	38	13	38	8	40	15	31	12
NSf	disagree	27	22	37	15	38	22	45	9
	agree	42	4	45	3	50	7	46	
	Total	30	18	40	11	42	17	46	7
PE	disagree	46	14	41	6	40	17	34	9
	agree	34	10	31	10	30	13	24	4
	Total	44	13	39	6	39	17	32	8
NL	disagree	41	24	34	4	39	26	31	10
	agree	23	20	38	4	39	18	20	16
	Total	38	24	35	4	39	25	30	11
NU	disagree	8	7	15	3	3	2	10	5
	agree	6	3	6	6				
	Total	8	6	14	3	3	1	8	4
NT	disagree	30	19	33	8	27	11	18	8
	agree	18	8	22	9	27	5	11	5
	Total	28	17	31	8	27	10	16	8
YT	disagree	34	18	40	10	51	18	23	10
	agree	29	33	27	10	50	13	29	10
	Total	34	20	37	10	51	17	24	10

Table B10: Percentage at or above criterion by days absent

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	0–2	32	32	41	17	41	27	34	20
	> 5	40	22	36	8	41	19	30	10
	Total	36	27	38	11	41	23	31	13
AB	0–2	40	40	38	26	48	33	37	27
	> 5	37	29	43	14	49	29	39	20
	Total	38	34	42	18	48	30	38	23
SK	0–2	35	22	39	10	49	16	39	8
	> 5	38	16	33	7	47	15	31	12
	Total	37	18	35	8	48	16	34	11
MBe	0–2	35	26	40	16	41	23	40	17
	> 5	43	18	36	12	40	23	33	11
	Total	40	21	37	13	40	23	35	13
MBf	0–2	37	25	49	14	43	32	45	23
	> 5	39	25	53	16	46	24	47	14
	Total	38	25	52	15	44	28	47	16
ONe	0–2	35	32	41	15	44	26	34	21
	> 5	47	23	38	9	45	25	29	10
	Total	42	27	40	12	44	25	32	15
ONf	0–2	29	29	42	9	49	26	29	9
	> 5	37	24	37	2	43	32	30	10
	Total	32	27	39	5	46	29	30	9
QCe	0–2	31	37			38	28		
	> 5	35	34			43	26		
	Total	33	35			41	27		
QCf	0–2	36	45			44	33		
	> 5	41	38			42	30		
	Total	38	42			43	31		
NBe	0–2	36	19	35	9	43	20	35	21
	> 5	36	22	36	7	43	17	31	7
	Total	36	21	36	7	43	18	32	11
NBf	0–2	35	24	54	9	39	31	38	24
	> 5	38	24	39	6	35	23	32	13
	Total	36	24	46	8	38	28	35	19
NSe	0–2	44	10	38	11	42	14	30	13
	> 5	39	12	36	5	38	14	28	9
	Total	41	11	37	7	40	14	28	10
NSf	0–2	38	12	44	13	36	28	54	8
	> 5	20	15	19	23	43	11	35	5
	Total	30	13	33	17	40	19	45	7
PE	0–2	41	16	40	7	37	20	32	12
	> 5	45	14	33	5	39	15	28	7
	Total	44	14	36	6	38	16	30	9
NL	0–2	32	24	43	4	42	20	33	15
	> 5	36	22	30	3	36	28	27	8
	Total	35	23	33	3	38	25	29	10
NU	0–2	8	6	20		4	4	33	
	> 5	9	6	11	3			5	5
	Total	8	6	12	3	2	2	9	5
NT	0–2	25	16	31	10	20	12	21	7
	> 5	27	18	31	8	31	10	17	9
	Total	27	17	31	9	28	10	18	9
YT	0–2	30	24	40	17	65	15	36	14
	> 5	32	18	37	8	50	18	18	11
	Total	31	20	38	11	54	17	21	12

Table B11: Percentage at or above criterion by working with parents on mathematics homework

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	rarely or never	37	32	40	12	38	31	35	14
	a few times a month or more	37	21	33	8	44	17	26	8
	Total	37	26	39	11	41	24	33	13
AB	rarely or never	37	38	43	22	43	38	38	24
	a few times a month or more	41	30	41	11	48	27	38	18
	Total	39	34	42	20	46	33	38	23
SK	rarely or never	38	22	38	9	49	22	36	12
	a few times a month or more	34	15	31	4	44	11	30	12
	Total	36	19	36	8	47	17	35	12
MBe	rarely or never	35	30	42	13	41	28	36	17
	a few times a month or more	39	15	32	8	40	18	30	8
	Total	37	23	40	12	40	23	35	15
MBf	rarely or never	42	26	52	16	41	34	43	18
	a few times a month or more	30	22	46	5	46	20	42	18
	Total	37	24	51	14	43	28	43	18
ONe	rarely or never	38	33	44	13	47	31	34	17
	a few times a month or more	41	21	34	8	45	22	31	10
	Total	39	26	42	12	46	26	33	15
ONf	rarely or never	31	31	41	7	44	32	34	11
	a few times a month or more	35	17	33	1	48	19	24	7
	Total	33	25	39	5	46	27	31	10
QCe	rarely or never	31	42			42	36		
	a few times a month or more	35	29			40	21		
	Total	33	36			41	30		
QCf	rarely or never	35	47			42	38		
	a few times a month or more	42	32			50	20		
	Total	38	41			45	31		
NBe	rarely or never	35	28	39	9	44	21	33	13
	a few times a month or more	35	14	29	4	41	15	25	7
	Total	35	21	37	8	42	18	32	12
NBf	rarely or never	37	34	46	10	37	34	38	21
	a few times a month or more	34	15	38	3	44	19	38	8
	Total	36	25	44	8	40	27	38	18
NSe	rarely or never	41	17	40	9	41	17	31	12
	a few times a month or more	37	8	30	4	38	13	25	9
	Total	38	12	37	8	39	15	30	12
NSf	rarely or never	30	25	41	13	43	12	45	6
	a few times a month or more	30		33	7	37	26	42	8
	Total	30	17	39	11	41	17	44	7
PE	rarely or never	47	15	43	7	43	19	33	9
	a few times a month or more	39	11	26	3	33	14	30	5
	Total	43	13	39	6	38	16	32	8
NL	rarely or never	41	29	38	5	42	32	33	13
	a few times a month or more	36	15	26	3	38	16	18	5
	Total	39	23	34	4	40	24	30	11
NU	rarely or never	15	6	14	3	3		11	5
	a few times a month or more	2	6	11	4	2	2		
	Total	8	6	13	3	3	1	8	4
NT	rarely or never	33	23	36	10	35	8	18	9
	a few times a month or more	24	11	19	4	19	9	7	4
	Total	28	17	31	9	27	9	15	8
YT	rarely or never	30	16	35	11	51	20	26	10
	a few times a month or more	39	22	48	6	51	12	19	12
	Total	35	20	38	10	51	16	24	10

Table B12: Percentage at or above criterion by frequency of teacher note giving

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	a few times a month or less	43	25	26	6	44	20	23	9
	a few times a week or more	34	27	42	12	40	25	38	14
	Total	37	26	38	11	41	23	35	13
AB	a few times a month or less	39	32	36	5	48	28	31	16
	a few times a week or more	39	35	45	23	45	35	41	25
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	39	22	34	7	47	20	28	9
	a few times a week or more	33	16	37	9	48	13	38	13
	Total	36	19	37	8	47	17	36	12
MBe	a few times a month or less	37	23	36	5	44	21	32	7
	a few times a week or more	37	22	42	16	37	25	36	19
	Total	37	22	40	12	40	23	35	16
MBf	a few times a month or less	37	25	46	18	45	31	40	16
	a few times a week or more	37	24	55	10	41	26	46	20
	Total	37	24	50	14	43	29	43	18
ONe	a few times a month or less	35	31	33	11	49	26	33	6
	a few times a week or more	44	21	45	12	43	26	34	17
	Total	39	27	43	12	46	26	34	16
ONf	a few times a month or less	32	33	37	6	44	34	35	10
	a few times a week or more	33	18	43	5	46	21	28	11
	Total	33	25	40	5	45	27	32	11
QCe	a few times a month or less	35	38			41	31		
	a few times a week or more	31	35			42	28		
	Total	33	36			42	29		
QCf	a few times a month or less	36	44			46	33		
	a few times a week or more	38	39			45	27		
	Total	37	42			45	30		
NBe	a few times a month or less	37	23	37	8	45	20	30	10
	a few times a week or more	33	18	35	8	38	16	32	13
	Total	35	21	36	8	42	18	32	12
NBf	a few times a month or less	39	29	44	11	41	29	42	18
	a few times a week or more	34	21	44	6	39	26	34	19
	Total	36	25	44	8	40	27	38	19
NSe	a few times a month or less	43	13	33	9	39	18	31	11
	a few times a week or more	34	11	41	7	40	12	29	12
	Total	38	12	37	8	40	15	30	12
NSf	a few times a month or less	34	20	47	11	36	19	46	8
	a few times a week or more	25	14	29	12	50	13	39	6
	Total	31	18	39	11	40	17	44	7
PE	a few times a month or less	47	15	36	3	42	18	33	6
	a few times a week or more	38	11	40	8	34	13	32	10
	Total	43	13	39	6	39	16	33	8
NL	a few times a month or less	45	16	22	3	42	25	26	7
	a few times a week or more	36	25	38	5	39	24	31	11
	Total	38	23	35	4	39	24	30	11
NU	a few times a month or less	13	7	11	3	8	4	13	7
	a few times a week or more	5	5	16	4				
	Total	8	6	14	3	3	1	9	5
NT	a few times a month or less	28	13	14	3	36	12	12	
	a few times a week or more	27	21	38	11	19	6	16	13
	Total	27	17	32	9	27	9	15	9
YT	a few times a month or less	28	21	35	14	41	27	18	8
	a few times a week or more	38	19	40	8	56	11	28	12
	Total	35	20	38	10	51	16	24	10

Table B13: Percentage at or above criterion by frequency of teacher showing how to do problems

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	a few times a month or less	49	16	23	2	46	12	16	2
	a few times a week or more	36	27	40	12	41	25	36	14
	Total	37	26	38	11	41	23	34	13
AB	a few times a month or less	28	31	31	2	46	29	23	9
	a few times a week or more	41	34	44	22	46	33	40	24
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	31	21	25	4	41	16	22	7
	a few times a week or more	37	19	38	9	48	17	37	12
	Total	36	19	37	8	47	17	36	12
MBe	a few times a month or less	30	17	35	4	39	17	24	3
	a few times a week or more	38	23	41	14	40	24	36	17
	Total	37	23	40	12	40	23	35	16
MBf	a few times a month or less	32	21	45	7	44	26	36	9
	a few times a week or more	38	25	51	16	43	29	44	19
	Total	37	24	50	14	43	29	43	18
ONe	a few times a month or less	30	22	37		48	19	28	
	a few times a week or more	41	27	44	13	46	27	34	17
	Total	39	26	43	12	46	26	33	16
ONf	a few times a month or less	34	26	31	2	54	26	26	
	a few times a week or more	32	25	41	6	44	27	32	12
	Total	33	25	40	5	45	27	32	11
QCe	a few times a month or less	32	35			46	22		
	a few times a week or more	33	36			41	30		
	Total	33	36			42	29		
QCf	a few times a month or less	33	38			27	38		
	a few times a week or more	38	42			46	30		
	Total	37	42			45	31		
NBe	a few times a month or less	36	17	37	2	35	16	8	5
	a few times a week or more	35	21	36	9	44	19	34	13
	Total	35	21	36	8	42	18	32	12
NBf	a few times a month or less	31	24	31	2	35	16	36	9
	a few times a week or more	37	25	45	9	40	29	39	19
	Total	36	25	44	8	40	27	38	18
NSe	a few times a month or less	38	11	30	7	44	9	21	5
	a few times a week or more	39	13	38	8	39	15	31	13
	Total	39	12	37	8	39	15	30	12
NSf	a few times a month or less	18	9	17		38	15	45	
	a few times a week or more	31	18	42	13	41	17	43	9
	Total	30	17	39	11	41	17	44	7
PE	a few times a month or less	37	7	38	3	53	3	25	3
	a few times a week or more	44	14	39	7	38	17	33	9
	Total	43	13	39	6	38	16	33	9
NL	a few times a month or less	45	16	33	3	37	17	26	3
	a few times a week or more	37	23	35	4	40	25	30	11
	Total	38	23	35	4	39	24	30	11
NU	a few times a month or less	11	4	9					
	a few times a week or more	7	6	14	4	3	2	11	6
	Total	8	6	14	3	3	1	9	5
NT	a few times a month or less	23	10	21		50	3		
	a few times a week or more	28	18	33	10	23	10	17	10
	Total	28	17	32	9	27	9	14	8
YT	a few times a month or less	36	29	22	17	50	29	21	4
	a few times a week or more	35	19	41	9	51	15	26	12
	Total	35	20	38	10	51	16	25	11

Table B14: Percentage at or above criterion by frequency of mathematics projects

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	a few times a month or less	39	31	43	13	42	28	36	15
	a few times a week or more	35	20	28	7	41	15	29	8
	Total	37	26	39	11	41	23	35	13
AB	a few times a month or less	38	36	46	25	46	36	38	27
	a few times a week or more	41	31	38	12	46	29	40	16
	Total	39	34	43	20	46	33	38	23
SK	a few times a month or less	37	23	37	11	48	20	37	15
	a few times a week or more	35	16	37	5	46	13	35	7
	Total	36	19	37	8	47	17	36	12
MBe	a few times a month or less	37	26	45	15	40	24	37	20
	a few times a week or more	37	16	33	6	41	22	28	7
	Total	37	23	41	12	40	23	35	16
MBf	a few times a month or less	39	26	52	17	43	33	45	20
	a few times a week or more	35	22	47	8	43	20	37	13
	Total	37	24	50	14	43	29	43	18
ONe	a few times a month or less	38	31	50	14	47	27	35	19
	a few times a week or more	42	19	28	8	45	23	31	9
	Total	40	26	43	12	46	26	34	16
ONf	a few times a month or less	29	32	43	7	47	31	35	14
	a few times a week or more	35	19	37	3	43	25	25	6
	Total	32	26	40	5	45	28	32	11
QCe	a few times a month or less	32	40			42	33		
	a few times a week or more	33	27			40	19		
	Total	33	37			42	30		
QCf	a few times a month or less	34	46			46	35		
	a few times a week or more	40	37			46	26		
	Total	38	41			46	30		
NBe	a few times a month or less	37	24	39	10	43	20	32	14
	a few times a week or more	31	14	28	4	42	14	30	7
	Total	35	21	36	8	42	19	32	12
NBf	a few times a month or less	39	25	45	11	42	27	41	21
	a few times a week or more	33	26	42	5	38	28	36	15
	Total	35	25	43	8	39	28	39	18
NSe	a few times a month or less	40	15	42	9	39	17	34	13
	a few times a week or more	36	7	26	5	38	10	19	8
	Total	39	12	37	8	39	15	30	12
NSf	a few times a month or less	29	24	38	10	34	22	44	9
	a few times a week or more	33	9	42	13	48	13	43	4
	Total	31	17	40	11	40	18	44	7
PE	a few times a month or less	43	15	45	7	40	18	33	10
	a few times a week or more	43	11	28	5	37	13	31	6
	Total	43	13	39	6	39	17	33	9
NL	a few times a month or less	38	26	37	6	40	28	34	14
	a few times a week or more	38	18	31	2	38	18	22	3
	Total	38	23	35	4	39	24	30	11
NU	a few times a month or less	12	9	17	4	7	4	17	8
	a few times a week or more	4	4	9	2				
	Total	8	6	13	3	3	1	9	5
NT	a few times a month or less	30	25	34	12	34	12	14	12
	a few times a week or more	26	7	30	5	18	5	13	5
	Total	28	17	32	9	27	9	14	9
YT	a few times a month or less	35	21	41	13	43	23	24	8
	a few times a week or more	36	20	33	6	60	10	26	15
	Total	36	20	38	10	51	17	25	11

Table B15: Percentage at or above criterion by frequency of work in pairs or small groups

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	a few times a month or less	38	28	40	11	40	25	33	15
	a few times a week or more	37	23	35	11	43	20	36	10
	Total	38	26	38	11	41	23	34	13
AB	a few times a month or less	37	37	45	20	46	35	40	26
	a few times a week or more	43	31	40	20	45	29	37	20
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	37	22	39	9	49	17	34	12
	a few times a week or more	36	14	33	8	43	16	39	12
	Total	37	19	36	8	47	17	36	12
MBe	a few times a month or less	34	26	42	16	41	23	36	21
	a few times a week or more	41	18	38	9	40	23	33	8
	Total	37	23	40	13	40	23	35	16
MBf	a few times a month or less	40	24	51	17	40	32	38	22
	a few times a week or more	35	25	48	10	45	27	49	13
	Total	37	25	50	14	43	29	43	18
ONe	a few times a month or less	38	28	46	14	48	27	34	16
	a few times a week or more	41	24	39	7	41	23	32	16
	Total	39	27	44	12	46	26	34	16
ONf	a few times a month or less	35	29	42	5	45	29	32	12
	a few times a week or more	31	21	36	7	45	26	31	9
	Total	33	25	40	6	45	28	32	11
QCe	a few times a month or less	34	37			43	30		
	a few times a week or more	31	36			39	28		
	Total	33	37			42	30		
QCf	a few times a month or less	36	44			43	32		
	a few times a week or more	39	38			50	30		
	Total	37	41			46	31		
NBe	a few times a month or less	37	24	36	9	42	19	32	12
	a few times a week or more	33	17	36	7	43	17	30	11
	Total	35	21	36	8	42	19	31	12
NBf	a few times a month or less	38	29	45	8	41	30	41	19
	a few times a week or more	35	22	41	9	38	26	35	17
	Total	36	25	43	8	39	28	39	18
NSe	a few times a month or less	39	12	36	8	43	13	30	11
	a few times a week or more	38	12	38	8	37	16	30	12
	Total	39	12	37	8	40	14	30	12
NSf	a few times a month or less	26	15	33	6	43	9	31	15
	a few times a week or more	31	18	42	12	37	22	47	5
	Total	30	17	40	10	39	18	43	7
PE	a few times a month or less	45	15	40	6	37	17	33	8
	a few times a week or more	42	10	36	7	42	16	32	10
	Total	43	13	39	6	39	16	33	9
NL	a few times a month or less	38	24	36	5	41	24	31	11
	a few times a week or more	39	21	33	4	39	24	28	9
	Total	38	23	34	4	40	24	30	11
NU	a few times a month or less	12	7	13	4	6	3	7	7
	a few times a week or more	5	5	17	3			14	
	Total	8	6	14	4	3	1	10	5
NT	a few times a month or less	31	21	31	8	32	8	15	8
	a few times a week or more	23	13	33	9	21	10	15	10
	Total	28	17	32	8	27	9	15	9
YT	a few times a month or less	36	20	40	6	49	13	30	6
	a few times a week or more	34	21	34	16	53	23	14	19
	Total	35	20	38	10	51	17	24	11

Table B16: Percentage at or above criterion by frequency of teacher assigning homework

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	a few times a month or less	32	23	11	11	37	18	22	10
	a few times a week or more	38	27	42	11	41	24	35	13
	Total	38	26	39	11	41	24	34	13
AB	a few times a month or less	31	26	27	7	44	22	33	10
	a few times a week or more	40	34	45	22	46	34	39	25
	Total	39	34	43	20	46	33	38	23
SK	a few times a month or less	36	26	35	7	48	17	30	3
	a few times a week or more	37	18	36	9	47	17	37	14
	Total	37	20	36	8	47	17	36	12
MBe	a few times a month or less	29	21	31	5	43	21	28	9
	a few times a week or more	39	23	42	14	40	24	36	17
	Total	38	22	40	13	41	24	35	16
MBf	a few times a month or less	36	20	44	3	39	18	19	15
	a few times a week or more	37	25	50	15	43	30	45	18
	Total	37	24	50	14	42	29	43	18
ONe	a few times a month or less	32	32	22	9	49	12	18	6
	a few times a week or more	40	26	45	12	46	27	34	17
	Total	39	26	43	12	47	26	34	16
ONf	a few times a month or less	33	25	26	3	40	20	27	3
	a few times a week or more	33	25	41	6	44	28	33	12
	Total	33	25	40	6	44	28	32	11
QCe	a few times a month or less	23	33			35	25		
	a few times a week or more	33	37			42	30		
	Total	32	37			41	29		
QCf	a few times a month or less	36	33			47	25		
	a few times a week or more	37	42			45	32		
	Total	37	41			45	31		
NBe	a few times a month or less	33	19	27	6	41	20	22	11
	a few times a week or more	35	21	37	9	42	19	32	13
	Total	35	21	36	8	42	19	31	12
NBf	a few times a month or less	33	25	21	2	28	33	23	9
	a few times a week or more	36	25	46	8	41	28	40	19
	Total	35	25	44	8	39	28	39	18
NSe	a few times a month or less	37	15	24	1	31	13	22	2
	a few times a week or more	38	12	39	9	41	15	32	14
	Total	38	12	37	8	40	15	30	12
NSf	a few times a month or less	25	22	21	16	44	22	25	
	a few times a week or more	33	15	46	9	40	15	49	9
	Total	31	17	40	10	41	17	45	7
PE	a few times a month or less	36	15	25	3	39	16	23	4
	a few times a week or more	45	13	41	7	38	17	34	10
	Total	44	13	39	6	38	17	32	9
NL	a few times a month or less	41	18	21	4	38	28	37	5
	a few times a week or more	38	23	37	5	40	24	29	12
	Total	38	23	35	4	40	24	30	11
NU	a few times a month or less	5	2	15		3	3		
	a few times a week or more	10	8	14	5	3		17	8
	Total	8	5	14	4	3	1	10	5
NT	a few times a month or less	18	8	32		33	8	23	
	a few times a week or more	29	19	32	9	26	9	12	11
	Total	28	18	32	9	27	9	14	9
YT	a few times a month or less	42	17	17	17	20	20	17	
	a few times a week or more	36	22	41	9	54	17	25	12
	Total	36	21	38	10	52	17	24	11

TABLE B17: PERCENTAGE AT OR ABOVE CRITERION BY FREQUENCY OF EXERCISES FROM THE TEXTBOOK

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	a few times a month or less	38	20	22	9	42	17	30	10
	a few times a week or more	38	27	41	11	41	25	35	14
	Total	38	26	39	11	41	24	34	13
AB	a few times a month or less	37	32	35	10	37	33	37	18
	a few times a week or more	39	34	44	21	48	33	39	24
	Total	39	34	43	20	46	33	38	23
SK	a few times a month or less	34	12	35	7	41	18	31	12
	a few times a week or more	37	21	37	9	49	17	37	12
	Total	36	19	36	8	47	17	36	12
MBe	a few times a month or less	32	20	34	10	42	19	29	13
	a few times a week or more	39	24	44	14	40	24	37	18
	Total	37	23	40	12	40	23	35	16
MBf	a few times a month or less	36	17	49	12	44	27	36	19
	a few times a week or more	37	26	50	14	42	29	46	17
	Total	37	24	50	14	43	29	43	18
ONe	a few times a month or less	42	28	33	10	50	21	25	21
	a few times a week or more	39	26	44	12	46	27	34	16
	Total	39	26	43	12	46	26	34	16
ONf	a few times a month or less	31	19	37	5	60	18	19	8
	a few times a week or more	33	27	40	6	43	29	33	11
	Total	33	26	40	6	45	27	32	11
QCe	a few times a month or less	20	40			41	23		
	a few times a week or more	35	36			42	30		
	Total	33	37			42	29		
QCf	a few times a month or less	37	33			46	18		
	a few times a week or more	38	42			45	33		
	Total	38	41			45	31		
NBe	a few times a month or less	30	21	37	5	41	12	26	8
	a few times a week or more	36	21	36	9	43	20	32	12
	Total	35	21	36	8	43	19	32	12
NBf	a few times a month or less	27	27	24	4	37	20	31	8
	a few times a week or more	37	24	45	9	40	29	39	19
	Total	36	25	43	8	40	28	38	18
NSe	a few times a month or less	33	9	28	5	42	11	25	9
	a few times a week or more	40	14	39	8	39	16	31	13
	Total	38	13	37	8	39	15	30	12
NSf	a few times a month or less	31	19	32	21	36	14	30	10
	a few times a week or more	31	17	43	5	42	17	47	6
	Total	31	18	40	10	41	16	44	7
PE	a few times a month or less	41	14	32	6	33	5	25	6
	a few times a week or more	44	14	40	6	39	18	33	9
	Total	43	14	39	6	38	16	32	8
NL	a few times a month or less	38	8	35	2	36	23	28	9
	a few times a week or more	38	24	34	5	40	24	30	11
	Total	38	23	35	4	40	24	30	11
NU	a few times a month or less	10	2	15		4	4		
	a few times a week or more	7	8	14	4	2		11	6
	Total	8	6	14	3	3	1	10	5
NT	a few times a month or less	17	4	24		17	2	13	
	a few times a week or more	29	19	33	11	29	11	15	11
	Total	28	17	32	9	27	9	15	9
YT	a few times a month or less	33	18	24	28	48	13	21	11
	a few times a week or more	36	20	41	5	52	18	25	11
	Total	35	19	38	10	51	16	25	11

Table B18: Percentage at or above criterion by frequency of students asking the teacher questions

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	a few times a month or less	41	17	24	7	33	12	22	2
	a few times a week or more	36	28	40	12	42	25	36	14
	Total	37	26	39	11	41	23	35	13
AB	a few times a month or less	30	29	45	8	51	13	29	10
	a few times a week or more	40	35	43	21	46	34	39	24
	Total	39	34	43	20	46	33	38	23
SK	a few times a month or less	34	10	25	5	42	14	22	3
	a few times a week or more	37	21	38	9	48	17	38	13
	Total	36	19	36	8	47	17	36	12
MBe	a few times a month or less	33	20	30	3	38	11	23	5
	a few times a week or more	38	23	42	14	41	25	36	17
	Total	38	23	40	12	40	23	35	16
MBf	a few times a month or less	40	21	53		35	28	43	7
	a few times a week or more	37	25	50	16	43	29	43	19
	Total	37	24	50	14	42	29	43	18
ONe	a few times a month or less	25	30	35	6	33	29	20	10
	a few times a week or more	41	26	44	12	47	26	35	17
	Total	39	26	43	12	46	26	34	16
ONf	a few times a month or less	23	17	30		17	28	24	4
	a few times a week or more	34	26	41	6	46	27	33	11
	Total	33	26	40	5	45	27	33	11
QCe	a few times a month or less	33	36			46	18		
	a few times a week or more	33	36			42	31		
	Total	33	36			42	30		
QCf	a few times a month or less	37	22			38	28		
	a few times a week or more	38	43			46	31		
	Total	38	41			45	30		
NBe	a few times a month or less	40	14	32	4	31	18	17	10
	a few times a week or more	35	22	37	9	43	19	33	13
	Total	36	21	36	8	42	19	32	12
NBf	a few times a month or less	30	11	25	2	36	20	15	5
	a few times a week or more	37	25	45	9	40	28	40	20
	Total	36	24	43	8	40	27	38	19
NSe	a few times a month or less	39	7	30		40	12	16	5
	a few times a week or more	39	13	38	9	40	15	32	13
	Total	39	12	37	8	40	15	31	12
NSf	a few times a month or less	40	10	13		45	18	44	
	a few times a week or more	28	18	44	13	39	17	43	7
	Total	29	18	38	10	40	17	44	5
PE	a few times a month or less	39	6	20	2	36	11	17	3
	a few times a week or more	44	14	41	7	39	17	34	9
	Total	43	13	39	6	39	16	33	9
NL	a few times a month or less	43	11	30		35	15	24	9
	a few times a week or more	37	24	36	5	40	25	31	11
	Total	38	23	35	4	40	24	30	11
NU	a few times a month or less	10	3	13					
	a few times a week or more	7	7	14	4	3	2	10	5
	Total	7	6	14	3	3	2	10	5
NT	a few times a month or less	20	8	26	3	29			
	a few times a week or more	29	19	33	10	27	11	18	10
	Total	28	18	32	9	27	9	15	9
YT	a few times a month or less	53	11	22		25	25	13	7
	a few times a week or more	34	21	42	13	53	16	25	11
	Total	36	20	38	11	50	17	23	11

Table B19: Percentage at or above criterion by frequency of discussion of things other than the lesson topic

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	a few times a month or less	39	29	40	12	45	25	37	15
	a few times a week or more	36	23	36	10	37	21	29	9
	Total	37	26	39	11	42	23	34	13
AB	a few times a month or less	43	36	43	26	44	38	39	26
	a few times a week or more	34	32	44	14	49	24	39	18
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	38	22	36	11	52	18	36	13
	a few times a week or more	34	17	37	5	42	15	38	9
	Total	36	19	36	8	47	17	36	12
MBe	a few times a month or less	36	26	40	14	41	25	34	20
	a few times a week or more	39	19	39	10	38	21	35	11
	Total	37	23	40	12	40	23	35	16
MBf	a few times a month or less	40	27	49	17	46	29	41	19
	a few times a week or more	32	20	52	9	40	27	47	16
	Total	37	24	50	14	43	28	43	18
ONe	a few times a month or less	38	30	45	14	45	29	37	16
	a few times a week or more	41	23	42	8	46	23	28	15
	Total	40	26	44	12	46	26	34	16
ONf	a few times a month or less	34	28	41	6	45	28	32	12
	a few times a week or more	30	21	38	5	43	26	29	9
	Total	33	25	40	6	45	27	32	11
QCe	a few times a month or less	34	39			43	31		
	a few times a week or more	31	31			40	27		
	Total	33	36			42	30		
QCf	a few times a month or less	39	45			44	33		
	a few times a week or more	33	32			50	21		
	Total	38	41			45	31		
NBe	a few times a month or less	35	26	38	9	42	20	32	12
	a few times a week or more	36	15	33	8	41	17	30	13
	Total	35	21	36	8	42	19	31	12
NBf	a few times a month or less	38	26	46	8	40	31	39	19
	a few times a week or more	33	24	36	8	39	21	35	15
	Total	36	25	43	8	39	28	38	18
NSe	a few times a month or less	40	14	39	8	41	16	33	14
	a few times a week or more	37	10	34	7	38	12	25	7
	Total	39	12	37	8	40	15	30	12
NSf	a few times a month or less	26	18	35	12	40	18	49	7
	a few times a week or more	36	16	48	6	38	15	31	6
	Total	31	17	40	10	39	17	44	7
PE	a few times a month or less	47	15	47	8	39	16	36	10
	a few times a week or more	40	11	30	5	38	16	27	6
	Total	44	13	39	6	39	16	33	9
NL	a few times a month or less	39	29	39	4	40	28	32	10
	a few times a week or more	36	15	28	4	38	18	25	12
	Total	38	23	35	4	39	24	30	11
NU	a few times a month or less	9	3	7	2	3	3	11	
	a few times a week or more	5	9	23	5	3		8	8
	Total	7	6	14	4	3	1	10	5
NT	a few times a month or less	32	19	38	9	34	8	15	5
	a few times a week or more	25	15	28	8	21	9	15	13
	Total	28	17	33	9	27	8	15	9
YT	a few times a month or less	34	17	39	15	44	17	27	9
	a few times a week or more	35	24	37	4	57	16	19	13
	Total	35	20	38	10	51	17	23	11

Table B20: Percentage at or above criterion by loss of 5–10 minutes because of disruption

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	a few times a month or less	37	29	43	13	41	27	37	16
	a few times a week or more	37	23	34	9	42	21	32	10
	Total	37	26	39	11	41	23	34	13
AB	a few times a month or less	39	38	43	25	41	39	41	23
	a few times a week or more	39	32	43	16	49	29	36	23
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	37	21	40	10	48	19	36	14
	a few times a week or more	35	19	33	7	47	15	36	9
	Total	36	19	37	8	47	17	36	12
MBe	a few times a month or less	38	23	42	15	40	25	37	20
	a few times a week or more	37	22	39	10	40	21	33	12
	Total	37	23	40	13	40	23	35	16
MBf	a few times a month or less	34	25	48	14	45	28	42	18
	a few times a week or more	39	24	52	14	42	28	43	19
	Total	37	24	50	14	43	28	43	18
ONe	a few times a month or less	39	29	45	14	45	30	35	17
	a few times a week or more	40	25	41	9	47	23	32	15
	Total	39	26	43	12	46	26	33	16
ONf	a few times a month or less	32	27	40	6	48	30	34	11
	a few times a week or more	33	24	41	5	43	25	29	11
	Total	33	26	40	6	45	27	31	11
QCe	a few times a month or less	33	39			44	33		
	a few times a week or more	33	35			41	27		
	Total	33	36			42	30		
QCf	a few times a month or less	40	43			47	34		
	a few times a week or more	35	39			44	27		
	Total	38	41			45	31		
NBe	a few times a month or less	34	26	38	10	43	23	34	14
	a few times a week or more	36	17	34	7	42	15	29	9
	Total	35	21	36	8	42	18	32	12
NBf	a few times a month or less	35	25	45	10	40	28	38	21
	a few times a week or more	36	25	40	6	39	28	38	14
	Total	36	25	43	8	40	28	38	18
NSe	a few times a month or less	44	13	40	9	41	18	36	15
	a few times a week or more	36	12	35	6	39	12	23	8
	Total	39	12	37	8	40	15	30	12
NSf	a few times a month or less	28	13	31	13	43	17	51	9
	a few times a week or more	31	21	53	6	40	15	32	5
	Total	30	18	40	10	41	16	44	7
PE	a few times a month or less	46	16	41	8	39	17	38	8
	a few times a week or more	42	11	36	4	39	15	27	10
	Total	44	13	38	6	39	16	32	9
NL	a few times a month or less	39	29	40	6	41	26	33	15
	a few times a week or more	37	19	30	3	39	23	28	5
	Total	38	23	35	4	39	24	31	11
NU	a few times a month or less	6	9	9	2	4	4	8	
	a few times a week or more	9	5	20	5	2		11	11
	Total	8	6	14	3	3	1	10	5
NT	a few times a month or less	24	23	36	7	31	10	18	8
	a few times a week or more	30	14	30	10	24	8	12	10
	Total	28	17	33	9	27	9	15	9
YT	a few times a month or less	35	22	37	14	43	16	25	13
	a few times a week or more	36	18	38	8	56	17	22	8
	Total	35	20	38	10	51	17	23	11

TABLE B21: PERCENTAGE AT OR ABOVE CRITERION BY USE OF BOOKS AND MAGAZINES OTHER THAN TEXTBOOKS

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	rarely or never	40	30	41	11	43	27	38	15
	a few times a month or more	35	22	36	11	39	19	30	11
	Total	37	26	39	11	41	24	35	13
AB	rarely or never	35	40	44	27	46	35	38	26
	a few times a month or more	42	27	42	14	46	29	39	20
	Total	39	34	43	20	46	33	39	23
SK	rarely or never	39	25	38	10	48	21	37	14
	a few times a month or more	33	15	34	6	45	12	34	7
	Total	36	20	36	8	47	17	36	12
MBe	rarely or never	37	27	44	17	43	25	37	19
	a few times a month or more	37	18	37	9	37	21	31	12
	Total	37	23	40	12	40	23	35	16
MBf	rarely or never	40	26	53	18	37	43	40	23
	a few times a month or more	37	24	48	11	43	26	45	14
	Total	37	24	50	14	42	29	43	18
ONe	rarely or never	40	33	49	15	47	30	35	18
	a few times a month or more	39	22	36	8	45	22	30	13
	Total	40	27	44	12	46	26	34	16
ONf	rarely or never	33	36	41	7	35	47	38	13
	a few times a month or more	32	23	39	5	47	23	29	10
	Total	33	25	40	6	45	28	32	11
QCe	rarely or never	31	39			43	33		
	a few times a month or more	34	34			40	25		
	Total	33	37			42	30		
QCf	rarely or never	31	48			44	38		
	a few times a month or more	41	38			46	27		
	Total	38	41			45	31		
NBe	rarely or never	38	25	40	10	43	23	33	14
	a few times a month or more	32	16	30	6	41	13	29	9
	Total	35	21	36	8	42	19	32	12
NBf	rarely or never	32	30	52	11	40	34	40	23
	a few times a month or more	37	23	40	7	39	25	38	16
	Total	36	24	43	8	39	27	39	18
NSe	rarely or never	40	15	43	10	43	16	35	15
	a few times a month or more	38	10	30	6	37	14	24	8
	Total	39	12	37	8	40	15	30	12
NSf	rarely or never	43	32	41	21	32	21	35	9
	a few times a month or more	27	11	39	5	43	16	52	3
	Total	31	16	40	10	40	17	45	5
PE	rarely or never	44	18	44	8	41	16	37	11
	a few times a month or more	43	10	33	5	36	16	27	5
	Total	43	13	39	6	39	16	32	9
NL	rarely or never	41	25	35	6	39	31	33	13
	a few times a month or more	36	21	34	3	39	15	25	7
	Total	38	23	35	4	39	24	30	10
NU	rarely or never	11	7	19	2	6		18	9
	a few times a month or more	5	5	9	5		3		
	Total	8	6	14	3	3	1	9	5
NT	rarely or never	30	26	34	12	27	12	20	15
	a few times a month or more	26	10	31	6	25	7	11	3
	Total	28	17	32	8	26	9	15	9
YT	rarely or never	37	24	35	16	55	15	30	12
	a few times a month or more	34	16	42	3	47	19	16	9
	Total	35	20	38	10	51	17	25	11

Table B22: Percentage at or above criterion by use of guest speakers or experts in mathematics

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	rarely or never	39	28	40	12	42	25	35	14
	a few times a month or more	29	18	33	3	29	10	33	6
	Total	37	26	39	11	41	23	35	13
AB	rarely or never	40	35	43	22	46	35	40	24
	a few times a month or more	31	25	41	9	46	7	17	10
	Total	39	34	43	20	46	33	39	23
SK	rarely or never	38	21	37	9	49	18	37	12
	a few times a month or more	23	9	30	6	31	9	21	5
	Total	36	20	36	8	47	17	36	12
MBe	rarely or never	37	25	41	14	41	25	35	17
	a few times a month or more	35	11	35	4	30	10	26	
	Total	37	23	40	12	40	23	35	16
MBf	rarely or never	37	30	52	16	45	34	44	19
	a few times a month or more	39	14	46	5	35	15	35	3
	Total	37	24	50	14	42	29	43	18
ONe	rarely or never	41	29	45	13	47	28	34	16
	a few times a month or more	30	16	32	2	35	7	24	16
	Total	39	27	44	12	46	26	34	16
ONf	rarely or never	33	30	44	7	46	31	34	12
	a few times a month or more	33	12	28	3	42	15	25	2
	Total	33	25	40	6	45	28	33	11
QCe	rarely or never	34	39			43	31		
	a few times a month or more	19	24			27	8		
	Total	32	37			42	30		
QCf	rarely or never	37	47			45	34		
	a few times a month or more	39	19			44	11		
	Total	37	42			45	31		
NBe	rarely or never	37	23	37	9	43	20	33	12
	a few times a month or more	25	9	23	4	34	9	14	7
	Total	35	21	36	8	42	19	32	12
NBf	rarely or never	39	30	46	9	40	32	40	19
	a few times a month or more	31	9	31	3	38	13	27	10
	Total	36	24	43	8	40	28	39	18
NSe	rarely or never	40	13	38	8	42	16	31	12
	a few times a month or more	29	7	29	3	23	5	16	
	Total	39	12	37	8	40	15	30	12
NSf	rarely or never	36	20	44	13	36	21	47	4
	a few times a month or more	14	7	26		53	11	25	13
	Total	30	17	40	10	40	18	44	5
PE	rarely or never	46	15	40	7	40	17	33	9
	a few times a month or more	33	3	37	5	29	12	22	5
	Total	43	13	39	6	39	16	32	9
NL	rarely or never	42	25	36	5	40	26	30	11
	a few times a month or more	23	12	27	3	36	4	18	6
	Total	39	23	34	4	40	24	30	11
NU	rarely or never	11	10	16	4	6	3	13	7
	a few times a month or more	3							
	Total	8	6	14	3	3	1	9	5
NT	rarely or never	33	21	36	9	30	11	17	12
	a few times a month or more	11	3	17	6	14	4	6	
	Total	28	17	32	8	27	9	14	9
YT	rarely or never	34	21	40	11	53	19	26	10
	a few times a month or more	43	10	25		44			14
	Total	35	20	39	10	52	17	24	11

Table B23: Percentage at or above criterion by use of computers

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	rarely or never	40	27	44	12	43	23	36	14
	a few times a month or more	30	24	24	9	32	24	32	11
	Total	37	26	39	11	41	24	35	13
AB	rarely or never	40	35	44	22	47	35	39	26
	a few times a month or more	38	32	42	17	44	29	39	18
	Total	39	34	43	20	46	33	39	23
SK	rarely or never	38	23	37	9	52	18	37	12
	a few times a month or more	32	13	35	5	35	16	29	11
	Total	36	20	36	8	47	17	36	12
MBe	rarely or never	36	26	42	14	44	22	34	22
	a few times a month or more	38	21	39	11	38	24	36	10
	Total	37	23	40	12	40	23	35	16
MBf	rarely or never	36	26	52	18	43	32	40	22
	a few times a month or more	38	23	47	9	42	26	46	11
	Total	37	24	50	14	42	29	43	18
ONe	rarely or never	39	30	46	13	48	25	35	14
	a few times a month or more	40	23	35	9	43	27	28	25
	Total	39	26	44	12	46	26	34	16
ONf	rarely or never	34	26	40	8	44	30	34	12
	a few times a month or more	33	24	39	1	48	24	26	9
	Total	33	25	40	6	45	27	33	11
QCe	rarely or never	33	40			43	30		
	a few times a month or more	30	26			31	30		
	Total	32	37			42	30		
QCf	rarely or never	36	47			45	33		
	a few times a month or more	43	23			44	19		
	Total	38	41			45	31		
NBe	rarely or never	37	24	36	8	44	20	32	11
	a few times a month or more	30	13	36	11	35	13	31	15
	Total	35	21	36	9	42	19	32	12
NBf	rarely or never	39	29	44	9	41	30	40	19
	a few times a month or more	31	18	42	4	37	23	29	16
	Total	36	24	44	8	40	28	39	18
NSe	rarely or never	38	15	41	9	44	14	31	13
	a few times a month or more	40	10	31	6	36	16	27	8
	Total	39	13	38	8	40	15	30	12
NSf	rarely or never	32	12	47	12	33	20	40	7
	a few times a month or more	28	22	21	5	52	14	57	
	Total	30	17	41	11	40	17	45	5
PE	rarely or never	46	14	41	6	43	14	34	9
	a few times a month or more	39	11	33	7	32	20	25	6
	Total	43	13	39	6	39	16	32	9
NL	rarely or never	42	23	35	5	41	26	32	9
	a few times a month or more	30	23	35	2	35	20	19	16
	Total	39	23	35	5	40	24	30	10
NU	rarely or never	13	7	14	2	7		13	
	a few times a month or more	4	6	14	7		2		14
	Total	8	6	14	4	3	1	9	5
NT	rarely or never	32	22	38	10	27	8	16	16
	a few times a month or more	22	11	25	7	27	11	15	3
	Total	28	17	32	9	27	9	15	9
YT	rarely or never	35	18	41	13	52	19	29	10
	a few times a month or more	36	22	31	5	51	13	17	12
	Total	35	20	38	10	52	17	25	11

Table B24: Percentage at or above criterion by use of calculators

Jurisdiction		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
		at	above	at	above	at	above	at	above
BC	a few times a month or less	37	14	28	6	35	13	12	7
	a few times a week or more	37	28	40	12	42	25	36	14
	Total	37	26	39	11	41	23	35	13
AB	a few times a month or less	28	25	37	26	38	30	37	26
	a few times a week or more	40	35	43	20	46	33	39	23
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	35	16	15	5	45	12	19	3
	a few times a week or more	36	21	39	9	48	19	37	12
	Total	36	20	37	8	47	17	36	12
MBe	a few times a month or less	34	15	27	6	33	9	27	15
	a few times a week or more	37	24	41	13	41	26	35	16
	Total	37	23	40	12	40	23	35	16
MBf	a few times a month or less	44	15	45	3	39	22	36	14
	a few times a week or more	36	26	51	15	44	30	43	18
	Total	37	24	50	14	43	28	43	18
ONe	a few times a month or less	37	22	50	5	43	17	25	19
	a few times a week or more	40	27	43	13	46	28	34	16
	Total	39	26	44	12	46	26	34	16
ONf	a few times a month or less	35	25	52	3	41	24	20	10
	a few times a week or more	33	25	39	6	45	28	33	11
	Total	33	25	40	6	45	28	32	11
QCe	a few times a month or less	27	21			32	18		
	a few times a week or more	33	38			43	30		
	Total	32	37			42	29		
QCf	a few times a month or less	40	20			33	12		
	a few times a week or more	37	46			48	35		
	Total	38	41			45	31		
NBe	a few times a month or less	36	16	25	4	38	17	18	10
	a few times a week or more	35	22	37	9	43	19	33	12
	Total	35	21	36	8	42	19	32	12
NBf	a few times a month or less	34	22	22	3	45	14	19	14
	a few times a week or more	36	25	45	9	39	29	39	19
	Total	36	24	43	8	40	28	39	18
NSe	a few times a month or less	42	13	24		41	12	10	2
	a few times a week or more	38	12	38	9	40	15	31	12
	Total	39	12	37	8	40	15	30	12
NSf	a few times a month or less	33	17	10	10	33		60	
	a few times a week or more	30	16	44	10	41	18	43	6
	Total	30	16	40	10	41	18	45	5
PE	a few times a month or less	40	12	33	2	37	13	25	8
	a few times a week or more	46	14	40	7	41	18	33	9
	Total	44	13	39	6	39	16	32	9
NL	a few times a month or less	34	17	17	2	41	15	17	7
	a few times a week or more	39	25	37	5	39	26	31	11
	Total	38	23	35	4	39	24	30	10
NU	a few times a month or less	6	2	9		4	4		
	a few times a week or more	9	9	14	4	2		10	5
	Total	8	6	14	3	3	1	8	4
NT	a few times a month or less	29	3	14	10	15	4	8	8
	a few times a week or more	27	21	35	8	30	11	17	9
	Total	28	17	33	9	27	9	15	9
YT	a few times a month or less	17	8	33	11	23		14	
	a few times a week or more	36	21	39	10	55	19	25	11
	Total	34	20	38	10	52	17	25	10

Table B25: Percentage at or above criterion by use of slides, films, videos

		Content Age 13		Content Age 16		Problem Age 13		Problem Age 16	
Jurisdiction		at	above	at	above	at	above	at	above
BC	a few times a month or less	39	28	41	12	43	24	35	14
	a few times a week or more	32	19	30	8	32	18	33	4
	Total	38	26	39	11	41	23	35	13
AB	a few times a month or less	40	37	43	23	47	34	41	22
	a few times a week or more	36	22	42	13	40	23	29	28
	Total	39	34	43	20	46	33	39	23
SK	a few times a month or less	38	21	38	8	49	18	37	13
	a few times a week or more	23	13	30	9	34	11	24	3
	Total	36	20	36	8	47	17	36	12
MBe	a few times a month or less	38	25	43	13	42	24	36	18
	a few times a week or more	32	15	30	9	31	18	28	5
	Total	37	23	40	13	40	23	35	16
MBf	a few times a month or less	38	26	51	15	44	31	41	19
	a few times a week or more	35	22	46	10	39	22	54	10
	Total	37	25	50	14	43	29	43	18
ONe	a few times a month or less	41	28	48	13	47	27	34	17
	a few times a week or more	36	22	28	7	38	22	30	11
	Total	40	26	44	12	46	26	34	16
ONf	a few times a month or less	34	27	40	7	45	30	31	13
	a few times a week or more	31	19	39	3	46	18	38	
	Total	33	25	40	6	45	28	32	11
QCe	a few times a month or less	33	39			43	31		
	a few times a week or more	26	25			26	17		
	Total	32	37			42	30		
QCf	a few times a month or less	39	44			45	33		
	a few times a week or more	36	28			41	15		
	Total	38	41			45	31		
NBe	a few times a month or less	36	24	37	8	43	20	33	13
	a few times a week or more	31	12	30	10	37	10	27	9
	Total	35	21	36	9	42	19	32	12
NBf	a few times a month or less	39	26	45	9	41	31	39	20
	a few times a week or more	28	22	35	3	37	15	33	5
	Total	36	25	43	8	40	28	39	18
NSe	a few times a month or less	42	13	39	9	43	16	31	13
	a few times a week or more	32	11	26	5	30	11	22	7
	Total	39	12	37	8	40	15	30	12
NSf	a few times a month or less	32	20	43	12	41	17	40	6
	a few times a week or more	28	3	28	6	43	21	67	
	Total	31	16	40	10	42	18	45	5
PE	a few times a month or less	47	14	41	6	40	17	34	10
	a few times a week or more	34	11	30	7	34	12	25	1
	Total	43	13	39	6	39	16	32	9
NL	a few times a month or less	41	25	36	5	42	26	31	11
	a few times a week or more	28	14	30	3	23	14	18	6
	Total	38	23	35	4	39	24	30	11
NU	a few times a month or less	9	8	13	1	2		6	6
	a few times a week or more	5	3	17	11	3	3	20	
	Total	7	6	14	4	3	1	9	5
NT	a few times a month or less	32	20	34	9	30	12	23	12
	a few times a week or more	15	9	30	9	19	3		4
	Total	28	18	33	9	27	9	15	9
YT	a few times a month or less	35	20	41	12	49	20	27	7
	a few times a week or more	36	18	26		56	6	7	36
	Total	35	20	38	10	51	17	24	11

APPENDIX C: Cross-Tabulation of School Questionnaire Variables with Achievement

TABLE C1: IN WHAT TYPE OF COMMUNITY, TOWN, OR CITY IS YOUR SCHOOL LOCATED?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	0.19	0.24	-0.01	0,19
	Significance (2-tailed)	0.02	0.00	0.92	0,02
	N	92.00	90.00	92.00	90,00
AB	Kendall tau_b	0.02	-0.07	0.19	0,04
	Significance (2-tailed)	0.77	0.46	0.02	0,66
	N	89.00	59.00	90.00	60,00
SK	Kendall tau_b	-0.11	-0.05	-0.08	-0,03
	Significance (2-tailed)	0.17	0.60	0.36	0,78
	N	90.00	69.00	88.00	71,00
MBe	Kendall tau_b	0.04	0.01	0.01	0,19
	Significance (2-tailed)	0.62	0.91	0.93	0,02
	N	90.00	84.00	90.00	83,00
MBf	Kendall tau_b	0.44	0.19	-0.02	-0,09
	Significance (2-tailed)	0.00	0.40	0.88	0,68
	N	37.00	14.00	37.00	14,00
ONe	Kendall tau_b	0.07	0.32	0.04	0,02
	Significance (2-tailed)	0.42	0.00	0.63	0,82
	N	71.00	61.00	71.00	62,00
ONf	Kendall tau_b	0.00	0.10	-0.05	0,17
	Significance (2-tailed)	0.98	0.35	0.65	0,11
	N	58.00	52.00	56.00	52,00
QCe	Kendall tau_b	0.07		0.31	
	Significance (2-tailed)	0.38		0.00	
	N	94.00		94.00	
QCf	Kendall tau_b	0.03		0.06	
	Significance (2-tailed)	0.76		0.47	
	N	87.00		82.00	
NBe	Kendall tau_b	0.00	0.00	-0.06	-0.03
	Significance (2-tailed)	0.00	0.00	-0.06	-0.03
	N	87.00	48.00	87.00	48.00
NBf	Kendall tau_b	0.19	-0.10	0.17	0.11
	Significance (2-tailed)	0.06	0.62	0.09	0.58
	N	64.00	17.00	63.00	17.00
NSe	Kendall tau_b	0.13	0.09	0.13	0.20
	Significance (2-tailed)	0.10	0.43	0.12	0.07
	N	92.00	49.00	92.00	49.00
NSf	Kendall tau_b	0.60	0.00	0.11	0.00
	Significance (2-tailed)	0.01	1.00	0.66	1.00
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	0.15	0.22	0.23	0.10
	Significance (2-tailed)	0.11	0.02	0.01	0.28
	N	71.00	68.00	72.00	66.00
NU	Kendall tau_b	0.27	0.24	0.21	-0.22
	Significance (2-tailed)	0.16	0.29	0.31	0.39
	N	25.00	18.00	22.00	16.00
NT	Kendall tau_b	0.48	0.58	0.42	0.72
	Significance (2-tailed)	0.00	0.01	0.02	0.00
	N	24.00	16.00	21.00	14.00
YT	Kendall tau_b	0.24	0.59	0.67	0.46
	Significance (2-tailed)	0.30	0.02	0.01	0.09
	N	13.00	11.00	10.00	10.00

Table C2: How many full-time-equivalent students are in your school?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	0.05	0.36	0.05	0.06
	Significance (2-tailed)	0.53	0.00	0.55	0.48
	N	94.00	92.00	94.00	92.00
AB	Kendall tau_b	0.03	-0.06	0.16	0.13
	Significance (2-tailed)	0.74	0.53	0.05	0.17
	N	89.00	59.00	90.00	60.00
SK	Kendall tau_b	-0.14	-0.01	0.12	0.09
	Significance (2-tailed)	0.10	0.89	0.17	0.34
	N	90.00	69.00	88.00	71.00
MBe	Kendall tau_b	0.13	0.00	0.13	0.12
	Significance (2-tailed)	0.12	1.00	0.11	0.15
	N	90.00	85.00	90.00	84.00
MBf	Kendall tau_b	0.06	0.43	0.00	-0.17
	Significance (2-tailed)	0.64	0.04	1.00	0.41
	N	39.00	15.00	39.00	15.00
ONe	Kendall tau_b	-0.01	0.25	-0.11	0.15
	Significance (2-tailed)	0.91	0.01	0.22	0.14
	N	72.00	61.00	72.00	62.00
ONf	Kendall tau_b	0.01	0.18	0.03	-0.02
	Significance (2-tailed)	0.94	0.09	0.76	0.82
	N	60.00	52.00	58.00	52.00
QCe	Kendall tau_b	0.19		0.17	
	Significance (2-tailed)	0.02		0.03	
	N	94.00		94.00	
QCf	Kendall tau_b	0.11		0.10	
	Significance (2-tailed)	0.18		0.25	
	N	90.00		85.00	
NBe	Kendall tau_b	0.28	-0.07	0.13	-0.12
	Significance (2-tailed)	0.00	0.55	0.11	0.29
	N	88.00	49.00	88.00	49.00
NBf	Kendall tau_b	0.04	0.15	0.06	-0.04
	Significance (2-tailed)	0.71	0.44	0.54	0.85
	N	63.00	16.00	62.00	16.00
NSe	Kendall tau_b	-0.05	0.25	-0.10	0.32
	Significance (2-tailed)	0.50	0.03	0.20	0.00
	N	93.00	49.00	93.00	49.00
NSf	Kendall tau_b	-0.34	0.00	0.00	0.00
	Significance (2-tailed)	0.18	1.00	1.00	1.00
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	0.08	0.13	0.22	0.08
	Significance (2-tailed)	0.41	0.16	0.02	0.39
	N	73.00	68.00	74.00	66.00
NU	Kendall tau_b	0.23	0.27	0.27	-0.10
	Significance (2-tailed)	0.24	0.23	0.20	0.71
	N	25.00	18.00	22.00	16.00
NT	Kendall tau_b	0.53	0.67	0.29	0.30
	Significance (2-tailed)	0.00	0.00	0.11	0.21
	N	24.00	16.00	21.00	14.00
YT	Kendall tau_b	0.09	0.32	0.26	0.29
	Significance (2-tailed)	0.68	0.21	0.31	0.28
	N	14.00	11.00	11.00	10.00

Table C3: What is the approximate average class size in your mathematics classes?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.06	0.20	-0.05	-0.10
	Significance (2-tailed)	0.48	0.02	0.54	0.24
	N	87.00	84.00	87.00	84.00
AB	Kendall tau_b	0.02	-0.04	0.09	0.26
	Significance (2-tailed)	0.85	0.73	0.27	0.01
	N	86.00	55.00	87.00	55.00
SK	Kendall tau_b	-0.07	-0.06	0.00	0.03
	Significance (2-tailed)	0.40	0.55	0.97	0.72
	N	83.00	61.00	81.00	64.00
MBe	Kendall tau_b	0.13	0.03	0.06	0.07
	Significance (2-tailed)	0.13	0.74	0.47	0.39
	N	85.00	80.00	85.00	79.00
MBf	Kendall tau_b	0.08	0.21	-0.18	-0.21
	Significance (2-tailed)	0.56	0.33	0.18	0.33
	N	35.00	14.00	35.00	14.00
ONe	Kendall tau_b	-0.02	0.11	-0.16	0.09
	Significance (2-tailed)	0.79	0.28	0.08	0.38
	N	68.00	57.00	68.00	58.00
ONf	Kendall tau_b	-0.14	0.24	-0.02	0.08
	Significance (2-tailed)	0.20	0.03	0.82	0.46
	N	51.00	49.00	49.00	49.00
QCe	Kendall tau_b	0.01		-0.03	
	Significance (2-tailed)	0.90		0.70	
	N	83.00		83.00	
QCf	Kendall tau_b	0.23		0.19	
	Significance (2-tailed)	0.01		0.03	
	N	78.00		74.00	
NBe	Kendall tau_b	0.07	0.09	0.00	-0.04
	Significance (2-tailed)	0.41	0.44	0.98	0.72
	N	76.00	44.00	76.00	44.00
NBf	Kendall tau_b	-0.10	-0.31	-0.10	0.04
	Significance (2-tailed)	0.37	0.16	0.34	0.85
	N	50.00	14.00	49.00	14.00
NSe	Kendall tau_b	0.11	0.21	0.00	0.29
	Significance (2-tailed)	0.20	0.08	0.97	0.01
	N	89.00	47.00	89.00	47.00
NSf	Kendall tau_b	-0.27	-1.00	-0.15	1.00
	Significance (2-tailed)	0.26	1.00	0.52	–
	N	12.00	2.00	12.00	2.00
NL	Kendall tau_b	0.16	0.24	0.34	0.18
	Significance (2-tailed)	0.08	0.01	0.00	0.07
	N	68.00	63.00	69.00	61.00
NU	Kendall tau_b	0.25	0.34	0.06	-0.03
	Significance (2-tailed)	0.18	0.13	0.78	0.90
	N	23.00	16.00	20.00	14.00
NT	Kendall tau_b	0.18	0.13	0.06	0.24
	Significance (2-tailed)	0.28	0.57	0.73	0.34
	N	22.00	15.00	20.00	12.00
YT	Kendall tau_b	0.18	0.55	0.20	0.00
	Significance (2-tailed)		0.04		1.00
	N		10.00		9.00

Table C4: What percentage of students have learning problems that need special attention?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.24	-0.25	-0.23	-0.33
	Significance (2-tailed)	0.00	0.00	0.01	0.00
	N	91.00	90.00	91.00	90.00
AB	Kendall tau_b	-0.25	-0.15	-0.31	-0.14
	Significance (2-tailed)	0.00	0.17	0.00	0.20
	N	87.00	58.00	88.00	59.00
SK	Kendall tau_b	-0.27	-0.11	-0.21	-0.08
	Significance (2-tailed)	0.00	0.28	0.02	0.41
	N	88.00	68.00	86.00	70.00
MBe	Kendall tau_b	-0.17	-0.35	-0.37	-0.17
	Significance (2-tailed)	0.05	0.00	0.00	0.06
	N	88.00	81.00	88.00	80.00
MBf	Kendall tau_b	-0.19	-0.27	-0.18	-0.33
	Significance (2-tailed)	0.16	0.24	0.19	0.14
	N	39.00	15.00	39.00	15.00
ONe	Kendall tau_b	-0.11	-0.21	-0.26	-0.10
	Significance (2-tailed)	0.24	0.06	0.01	0.36
	N	68.00	57.00	68.00	58.00
ONf	Kendall tau_b	0.07	-0.01	0.09	-0.16
	Significance (2-tailed)	0.49	0.90	0.41	0.17
	N	59.00	51.00	57.00	51.00
QCe	Kendall tau_b	-0.29		-0.43	
	Significance (2-tailed)	0.00		0.00	
	N	89.00		89.00	
QCf	Kendall tau_b	-0.18		-0.25	
	Significance (2-tailed)	0.05		0.01	
	N	85.00		80.00	
NBe	Kendall tau_b	-0.21	-0.01	-0.14	0.04
	Significance (2-tailed)	0.02	0.91	0.11	0.77
	N	84.00	48.00	84.00	48.00
NBf	Kendall tau_b	0.21	0.02	0.21	0.37
	Significance (2-tailed)	0.05	0.92	0.05	0.08
	N	63.00	17.00	62.00	17.00
NSe	Kendall tau_b	0.00	-0.06	-0.04	0.06
	Significance (2-tailed)	0.95	0.63	0.62	0.61
	N	92.00	47.00	92.00	47.00
NSf	Kendall tau_b	-0.62	–	-0.17	–
	Significance (2-tailed)	0.02	–	0.52	–
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	-0.16	-0.18	0.03	-0.13
	Significance (2-tailed)	0.11	0.07	0.79	0.22
	N	68.00	68.00	69.00	66.00
NU	Kendall tau_b	0.01	0.04	0.09	-0.16
	Significance (2-tailed)	0.97	0.88	0.68	0.55
	N	23.00	16.00	21.00	15.00
NT	Kendall tau_b	-0.28	-0.14	-0.37	-0.14
	Significance (2-tailed)	0.12	0.56	0.06	0.58
	N	22.00	14.00	20.00	13.00
YT	Kendall tau_b	-0.02	-0.27	0.08	-0.07
	Significance (2-tailed)	0.95	0.31	0.76	0.79
	N	14.00	11.00	11.00	10.00

Table C5: What percentage of students come from single-parent families?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.15	-0.15	-0.08	-0.36
	Significance (2-tailed)	0.07	0.07	0.35	0.00
	N	89.00	89.00	89.00	89.00
AB	Kendall tau_b	-0.28	-0.21	-0.25	-0.11
	Significance (2-tailed)	0.00	0.05	0.00	0.29
	N	87.00	56.00	88.00	57.00
SK	Kendall tau_b	-0.23	-0.23	-0.33	-0.18
	Significance (2-tailed)	0.01	0.02	0.00	0.08
	N	87.00	67.00	86.00	69.00
MBe	Kendall tau_b	-0.15	-0.29	-0.24	-0.22
	Significance (2-tailed)	0.07	0.00	0.00	0.02
	N	88.00	81.00	88.00	80.00
MBf	Kendall tau_b	0.10	0.24	-0.07	0.29
	Significance (2-tailed)	0.44	0.31	0.63	0.22
	N	38.00	13.00	38.00	13.00
ONe	Kendall tau_b	-0.04	-0.05	-0.11	-0.02
	Significance (2-tailed)	0.68	0.67	0.27	0.88
	N	66.00	53.00	66.00	54.00
ONf	Kendall tau_b	-0.12	-0.07	-0.20	-0.03
	Significance (2-tailed)	0.29	0.56	0.09	0.82
	N	52.00	48.00	50.00	48.00
QCe	Kendall tau_b	-0.19		-0.28	
	Significance (2-tailed)	0.03		0.00	
	N	88.00		88.00	
QCf	Kendall tau_b	-0.07		-0.14	
	Significance (2-tailed)	0.40		0.11	
	N	85.00		80.00	
NBe	Kendall tau_b	-0.13	0.07	-0.10	-0.06
	Significance (2-tailed)	0.13	0.54	0.27	0.63
	N	83.00	47.00	83.00	47.00
NBf	Kendall tau_b	0.11	-0.07	0.15	-0.10
	Significance (2-tailed)	0.30	0.74	0.16	0.64
	N	59.00	16.00	58.00	16.00
NSe	Kendall tau_b	-0.11	-0.13	-0.01	-0.16
	Significance (2-tailed)	0.20	0.28	0.89	0.17
	N	90.00	47.00	90.00	47.00
NSf	Kendall tau_b	-0.22	–	-0.26	–
	Significance (2-tailed)	0.41	–	0.36	–
	N	11.00	3.00	11.00	3.00
NL	Kendall tau_b	-0.08	0.11	0.12	0.07
	Significance (2-tailed)	0.41	0.27	0.24	0.46
	N	68.00	67.00	69.00	65.00
NU	Kendall tau_b	0.26	0.35	0.18	0.10
	Significance (2-tailed)	0.18	0.14	0.39	0.70
	N	23.00	16.00	21.00	15.00
NT	Kendall tau_b	-0.09	-0.24	0.10	-0.26
	Significance (2-tailed)	0.60	0.32	0.59	0.32
	N	21.00	14.00	20.00	12.00
YT	Kendall tau_b	-0.10	-0.44	0.02	-0.29
	Significance (2-tailed)	0.66	0.10	0.93	0.30
	N	14.00	11.00	11.00	10.00

Table C6: What percentage of students have health or nutrition problems that inhibit learning?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.26	-0.29	-0.28	-0.33
	Significance (2-tailed)	0.00	0.00	0.00	0.00
	N	91.00	89.00	91.00	89.00
AB	Kendall tau_b	-0.15	-0.16	-0.21	-0.26
	Significance (2-tailed)	0.10	0.16	0.02	0.02
	N	87.00	56.00	88.00	57.00
SK	Kendall tau_b	-0.30	-0.05	-0.26	-0.13
	Significance (2-tailed)	0.00	0.65	0.00	0.19
	N	89.00	68.00	87.00	70.00
MBe	Kendall tau_b	-0.29	-0.31	-0.34	-0.28
	Significance (2-tailed)	0.00	0.00	0.00	0.00
	N	88.00	82.00	88.00	81.00
MBf	Kendall tau_b	-0.09	-0.27	-0.17	-0.35
	Significance (2-tailed)	0.50	0.26	0.23	0.14
	N	38.00	14.00	38.00	14.00
ONe	Kendall tau_b	-0.24	-0.11	-0.24	-0.26
	Significance (2-tailed)	0.02	0.31	0.02	0.02
	N	68.00	56.00	68.00	57.00
ONf	Kendall tau_b	0.09	-0.14	-0.18	-0.25
	Significance (2-tailed)	0.43	0.24	0.11	0.04
	N	58.00	50.00	56.00	50.00
QCe	Kendall tau_b	-0.22		-0.26	
	Significance (2-tailed)	0.01		0.00	
	N	85.00		85.00	
QCf	Kendall tau_b	-0.30		-0.09	
	Significance (2-tailed)	0.00		0.33	
	N	82.00		77.00	
NBe	Kendall tau_b	-0.07	0.02	-0.08	-0.04
	Significance (2-tailed)	0.44	0.90	0.35	0.72
	N	83.00	47.00	83.00	47.00
NBf	Kendall tau_b	0.01	0.03	0.02	0.10
	Significance (2-tailed)	0.92	0.88	0.85	0.65
	N	63.00	17.00	62.00	17.00
NSe	Kendall tau_b	-0.01	-0.03	-0.19	-0.18
	Significance (2-tailed)	0.95	0.79	0.03	0.14
	N	90.00	48.00	90.00	48.00
NSf	Kendall tau_b	–	–	–	–
	Significance (2-tailed)	–	–	–	–
	N	11.00	3.00	11.00	3.00
NL	Kendall tau_b	-0.02	-0.18	-0.02	-0.08
	Significance (2-tailed)	0.82	0.07	0.88	0.45
	N	66.00	67.00	67.00	65.00
NU	Kendall tau_b	-0.24	-0.10	0.01	-0.31
	Significance (2-tailed)	0.23	0.66	0.96	0.22
	N	22.00	16.00	20.00	15.00
NT	Kendall tau_b	-0.44	-0.51	-0.57	-0.16
	Significance (2-tailed)	0.01	0.03	0.00	0.53
	N	21.00	14.00	20.00	12.00
YT	Kendall tau_b	-0.16	-0.49	-0.16	-0.06
	Significance (2-tailed)	0.49	0.06	0.54	0.82
	N	14.00	11.00	11.00	10.00

Table C7: To what degree is your school's capacity to provide instruction limited by lack of parental support for the school?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.21	-0.23	-0.22	-0.18
	Significance (2-tailed)	0.01	0.01	0.01	0.04
	N	93.00	91.00	93.00	91.00
AB	Kendall tau_b	-0.21	-0.10	-0.24	-0.03
	Significance (2-tailed)	0.01	0.36	0.00	0.78
	N	89.00	59.00	90.00	60.00
SK	Kendall tau_b	-0.11	0.00	-0.19	-0.18
	Significance (2-tailed)	0.20	0.97	0.02	0.06
	N	90.00	69.00	88.00	71.00
MBe	Kendall tau_b	-0.05	-0.24	-0.26	-0.35
	Significance (2-tailed)	0.54	0.01	0.00	0.00
	N	91.00	85.00	91.00	84.00
MBf	Kendall tau_b	0.02	-0.25	0.11	-0.11
	Significance (2-tailed)	0.87	0.25	0.41	0.63
	N	39.00	15.00	39.00	15.00
ONe	Kendall tau_b	-0.12	-0.13	-0.16	-0.19
	Significance (2-tailed)	0.18	0.22	0.09	0.05
	N	72.00	60.00	72.00	61.00
ONf	Kendall tau_b	0.05	-0.14	0.03	-0.03
	Significance (2-tailed)	0.64	0.19	0.81	0.79
	N	60.00	52.00	58.00	52.00
QCe	Kendall tau_b	-0.12		-0.29	
	Significance (2-tailed)	0.15		0.00	
	N	91.00		91.00	
QCf	Kendall tau_b	-0.18		-0.09	
	Significance (2-tailed)	0.03		0.30	
	N	86.00		81.00	
NBe	Kendall tau_b	-0.05	-0.03	-0.03	-0.01
	Significance (2-tailed)	0.56	0.81	0.69	0.92
	N	86.00	48.00	86.00	48.00
NBf	Kendall tau_b	-0.16	-0.30	0.06	-0.12
	Significance (2-tailed)	0.12	0.15	0.59	0.58
	N	61.00	16.00	60.00	16.00
NSe	Kendall tau_b	-0.01	-0.09	-0.14	-0.15
	Significance (2-tailed)	0.95	0.42	0.09	0.19
	N	92.00	47.00	92.00	47.00
NSf	Kendall tau_b	-0.22	-1.00	-0.31	1.00
	Significance (2-tailed)	0.37	0.12	0.21	–
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	-0.20	-0.10	-0.11	-0.04
	Significance (2-tailed)	0.04	0.29	0.26	0.68
	N	69.00	67.00	71.00	65.00
NU	Kendall tau_b	-0.02	-0.18	-0.10	-0.36
	Significance (2-tailed)	0.89	0.42	0.61	0.15
	N	25.00	18.00	22.00	16.00
NT	Kendall tau_b	-0.26	-0.30	-0.60	-0.55
	Significance (2-tailed)	0.12	0.18	0.00	0.02
	N	24.00	16.00	21.00	14.00
YT	Kendall tau_b	-0.34	-0.37	0.10	0.10
	Significance (2-tailed)	0.13	0.14	0.68	0.71
	N	14.00	11.00	11.00	10.00

TABLE C8: TO WHAT EXTENT IS YOUR SCHOOL'S CAPACITY TO PROVIDE INSTRUCTION LIMITED BY RANGE OF STUDENT ABILITIES IN THE SCHOOL?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.26	-0.28	-0.28	-0.26
	Significance (2-tailed)	0.00	0.00	0.00	0.00
	N	92.00	90.00	92.00	90.00
AB	Kendall tau_b	-0.28	-0.04	-0.24	0.00
	Significance (2-tailed)	0.00	0.72	0.00	0.99
	N	89.00	59.00	90.00	60.00
SK	Kendall tau_b	-0.14	-0.13	-0.15	-0.14
	Significance (2-tailed)	0.10	0.16	0.07	0.13
	N	90.00	68.00	88.00	70.00
MBe	Kendall tau_b	-0.16	-0.37	-0.20	-0.42
	Significance (2-tailed)	0.05	0.00	0.01	0.00
	N	91.00	85.00	91.00	84.00
MBf	Kendall tau_b	0.10	-0.45	0.03	0.14
	Significance (2-tailed)	0.43	0.04	0.83	0.52
	N	39.00	15.00	39.00	15.00
ONe	Kendall tau_b	-0.11	-0.23	-0.16	-0.15
	Significance (2-tailed)	0.22	0.02	0.08	0.13
	N	71.00	60.00	71.00	61.00
ONf	Kendall tau_b	-0.09	-0.18	-0.08	-0.13
	Significance (2-tailed)	0.37	0.11	0.47	0.23
	N	59.00	52.00	57.00	52.00
QCe	Kendall tau_b	-0.05		-0.34	
	Significance (2-tailed)	0.53		0.00	
	N	91.00		91.00	
QCf	Kendall tau_b	-0.19		-0.07	
	Significance (2-tailed)	0.03		0.47	
	N	86.00		81.00	
NBe	Kendall tau_b	-0.19	-0.05	-0.19	0.00
	Significance (2-tailed)	0.02	0.68	0.03	0.97
	N	86.00	47.00	86.00	47.00
NBf	Kendall tau_b	-0.02	0.09	-0.01	-0.01
	Significance (2-tailed)	0.87	0.66	0.92	0.96
	N	61.00	16.00	60.00	16.00
NSe	Kendall tau_b	-0.03	-0.09	-0.23	-0.28
	Significance (2-tailed)	0.73	0.41	0.00	0.01
	N	91.00	47.00	91.00	47.00
NSf	Kendall tau_b	-0.02	-0.82	-0.46	0.82
	Significance (2-tailed)	0.94	0.22	0.06	0.22
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	-0.07	-0.20	0.03	-0.02
	Significance (2-tailed)	0.49	0.04	0.79	0.85
	N	69.00	67.00	71.00	65.00
NU	Kendall tau_b	0.30	0.08	0.29	-0.54
	Significance (2-tailed)	0.12	0.71	0.17	0.04
	N	25.00	18.00	22.00	16.00
NT	Kendall tau_b	-0.41	-0.54	-0.35	-0.26
	Significance (2-tailed)	0.02	0.02	0.06	0.30
	N	24.00	16.00	21.00	14.00
YT	Kendall tau_b	-0.39	-0.55	-0.09	0.08
	Significance (2-tailed)	0.10	0.04	0.72	0.76
	N	14.00	11.00	11.00	10.00

Table C9: To what extent is your school's capacity to provide instruction limited by students' home backgrounds?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.23	-0.22	-0.36	-0.31
	Significance (2-tailed)	0.00	0.01	0.00	0.00
	N	93.00	91.00	93.00	91.00
AB	Kendall tau_b	-0.21	0.01	-0.19	0.05
	Significance (2-tailed)	0.01	0.95	0.02	0.64
	N	88.00	59.00	89.00	60.00
SK	Kendall tau_b	-0.13	-0.09	-0.19	-0.16
	Significance (2-tailed)	0.12	0.36	0.02	0.10
	N	89.00	69.00	87.00	71.00
MBe	Kendall tau_b	-0.08	-0.36	-0.19	-0.35
	Significance (2-tailed)	0.35	0.00	0.02	0.00
	N	91.00	85.00	91.00	84.00
MBf	Kendall tau_b	0.10	-0.04	0.11	0.06
	Significance (2-tailed)	0.45	0.86	0.41	0.78
	N	38.00	15.00	38.00	15.00
ONe	Kendall tau_b	0.01	-0.25	-0.15	-0.21
	Significance (2-tailed)	0.93	0.01	0.09	0.04
	N	72.00	60.00	72.00	61.00
ONf	Kendall tau_b	-0.04	-0.12	0.01	-0.06
	Significance (2-tailed)	0.70	0.28	0.96	0.57
	N	60.00	51.00	58.00	51.00
QCe	Kendall tau_b	-0.09		-0.39	
	Significance (2-tailed)	0.29		0.00	
	N	91.00		91.00	
QCf	Kendall tau_b	-0.23		-0.16	
	Significance (2-tailed)	0.01		0.06	
	N	86.00		81.00	
NBe	Kendall tau_b	-0.11	-0.06	-0.04	0.03
	Significance (2-tailed)	0.17	0.62	0.62	0.76
	N	87.00	48.00	87.00	48.00
NBf	Kendall tau_b	-0.11	-0.15	-0.04	-0.02
	Significance (2-tailed)	0.27	0.48	0.67	0.92
	N	61.00	16.00	60.00	16.00
NSe	Kendall tau_b	-0.01	-0.11	-0.07	-0.25
	Significance (2-tailed)	0.89	0.38	0.41	0.04
	N	91.00	46.00	91.00	46.00
NSf	Kendall tau_b	-0.15	-1.00	-0.34	1.00
	Significance (2-tailed)	0.54	0.12	0.19	–
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	-0.01	-0.14	0.03	-0.06
	Significance (2-tailed)	0.92	0.16	0.73	0.56
	N	69.00	67.00	71.00	65.00
NU	Kendall tau_b	-0.04	-0.13	-0.16	0.15
	Significance (2-tailed)	0.83	0.58	0.44	0.56
	N	25.00	18.00	22.00	16.00
NT	Kendall tau_b	-0.24	-0.28	-0.52	-0.17
	Significance (2-tailed)	0.16	0.24	0.00	0.51
	N	24.00	16.00	21.00	14.00
YT	Kendall tau_b	-0.42	-0.69	0.11	-0.03
	Significance (2-tailed)	0.06	0.01	0.67	0.92
	N	14.00	11.00	11.00	10.00

Table C10: To what extent is your school's capacity to provide instruction limited by community conditions (e.g., language, migration)?

Jurisdiction		Content Age 13	Content Age 16	Problem Age 13	Problem Age 16
BC	Kendall tau_b	-0.12	-0.05	-0.15	-0.20
	Significance (2-tailed)	0.14	0.55	0.06	0.02
	N	92.00	91.00	92.00	91.00
AB	Kendall tau_b	-0.18	0.02	-0.15	0.00
	Significance (2-tailed)	0.04	0.83	0.07	0.97
	N	88.00	59.00	89.00	60.00
SK	Kendall tau_b	-0.13	-0.06	-0.06	-0.11
	Significance (2-tailed)	0.14	0.55	0.47	0.24
	N	89.00	69.00	87.00	71.00
MBe	Kendall tau_b	-0.22	-0.34	-0.23	-0.22
	Significance (2-tailed)	0.01	0.00	0.01	0.01
	N	90.00	84.00	90.00	83.00
MBf	Kendall tau_b	0.06	-0.37	0.08	-0.09
	Significance (2-tailed)	0.65	0.08	0.56	0.67
	N	39.00	15.00	39.00	15.00
ONe	Kendall tau_b	-0.09	-0.04	-0.11	-0.24
	Significance (2-tailed)	0.35	0.69	0.24	0.01
	N	72.00	60.00	72.00	61.00
ONf	Kendall tau_b	0.15	-0.08	0.12	0.03
	Significance (2-tailed)	0.14	0.46	0.26	0.76
	N	60.00	51.00	58.00	51.00
QCe	Kendall tau_b	-0.12		-0.26	
	Significance (2-tailed)	0.15		0.00	
	N	90.00		90.00	
QCf	Kendall tau_b	-0.23		-0.09	
	Significance (2-tailed)	0.01		0.30	
	N	87.00		82.00	
NBe	Kendall tau_b	-0.10	-0.01	0.06	0.08
	Significance (2-tailed)	0.23	0.94	0.48	0.52
	N	87.00	48.00	87.00	48.00
NBf	Kendall tau_b	-0.04	-0.18	-0.10	-0.23
	Significance (2-tailed)	0.70	0.39	0.35	0.28
	N	60.00	16.00	59.00	16.00
NSe	Kendall tau_b	-0.06	-0.02	-0.14	0.03
	Significance (2-tailed)	0.45	0.85	0.09	0.78
	N	91.00	46.00	91.00	46.00
NSf	Kendall tau_b	0.33	-0.33	0.23	0.33
	Significance (2-tailed)	0.17	0.60	0.34	0.60
	N	12.00	3.00	12.00	3.00
NL	Kendall tau_b	0.03	-0.07	-0.10	-0.10
	Significance (2-tailed)	0.80	0.47	0.30	0.31
	N	69.00	67.00	71.00	65.00
NU	Kendall tau_b	-0.28	-0.41	-0.17	-0.54
	Significance (2-tailed)	0.13	0.06	0.41	0.03
	N	25.00	18.00	22.00	16.00
NT	Kendall tau_b	-0.18	-0.14	-0.44	-0.15
	Significance (2-tailed)	0.28	0.54	0.02	0.55
	N	24.00	16.00	21.00	14.00
YT	Kendall tau_b	-0.42	-0.54	-0.02	-0.27
	Significance (2-tailed)	0.06	0.04	0.93	0.33
	N	14.00	11.00	11.00	10.00