



Grade 9 Assessment of Mathematics, 2003–2004

Provincial Results: Detailed Data Tables

November 2004

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Explanation of Terms

All Students:	In this category, data are reported for all students in the program. The number of students in each reporting category is reported as a percentage of all students in the program (i.e., students at the four levels of achievement and those in the exempt, no data, NEIS and Below Level 1 categories described below).
Participating Students:	In this category, results are reported as a percentage of those students who took part in the assessment (i.e., students at the four levels of achievement and those in the Below Level 1 and NEIS categories described below). Students in the exempt and no data categories are excluded.
Levels 1–4:	The levels of achievement are aligned with the four-level scale developed by the Ministry of Education and used on the Provincial Report Card. Level 4: The student has demonstrated the required knowledge and skills. Achievement exceeds the provincial standard. Level 3: The student has demonstrated most of the required knowledge and skills. Achievement meets the provincial standard. Level 2: The student has demonstrated some of the required knowledge and skills. Achievement approaches the provincial standard. Level 1: The student has demonstrated some of the required knowledge and skills in limited ways. Achievement falls much below the provincial standard.
Provincial Standard:	The Ministry of Education, in <i>The Ontario Curriculum</i> , has set Level 3 as the provincial standard. Level 3 identifies a high level of achievement of the provincial expectations.
Below L1:	“Below Level 1” is used when students have provided enough information to score but have not demonstrated enough evidence of knowledge and understanding to be assigned Level 1.
NEIS:	“Not Enough Information to Score” is used when less than 50% of the items were completed, such that a level of achievement cannot be assigned for an overall score.
No data:	Non-exempt students for whom EQAO did not receive completed assessment booklets.
Exempt:	Students who were formally exempted from participation in the assessment as identified by the school on the Student Information Form (SIF).
ESL/ELD:	English as a second language (ESL)/English literacy development (ELD) are students identified by the school as ESL/ELD learners on the SIF.
Students with Special Needs:	Students whose SIF indicated that they have been formally identified by an Identification, Placement and Review Committee (IPRC), as well as students who have an Individual Education Plan (IEP). Students whose sole identified exceptionality is giftedness are not included this subgroup.
Student Receiving	Students receiving accommodations are students with an IEP who may or may not have been identified as “exceptional pupils” by an IPRC. Detailed information

Accommodations: about accommodations is available in the *Steps and Teacher's Scripts*.

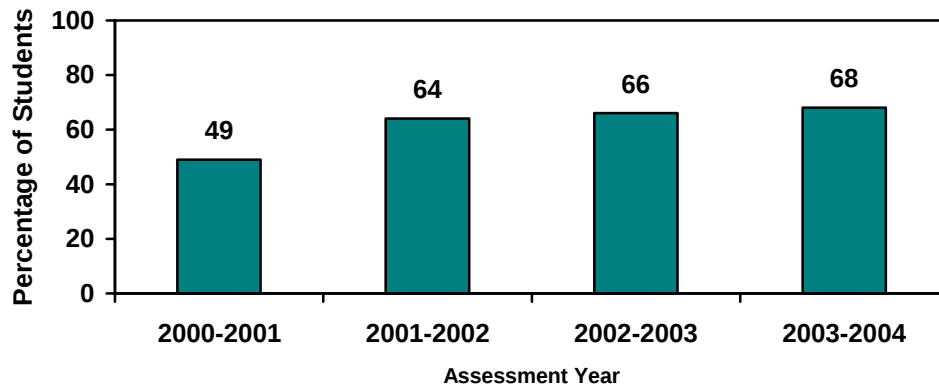
Students Receiving Special Provisions: Students receiving accommodations are students identified as ESL/ELD learners on the SIF. Detailed information about special provisions is available in the *Steps and Teacher's Scripts*.

Academic Results at a Glance

Comparison of Results over Time

Percentage of All Students at or Above the Provincial Standard¹

2000–2001 (# = 95 312)	2001–2002 (# = 99 094)	2002–2003 (# = 100 717)	2003–2004 (# = 102 923)
49%	64%	66%	68%



Observations

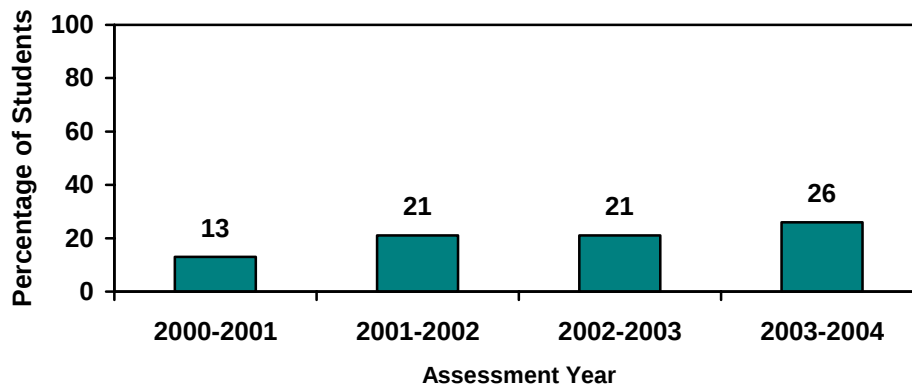
- 68% of the students in the academic program performed at or above the provincial standard.
- There has been a slow but steady increase in the percentage of students in the academic program performing at or above the provincial standard over the past three years.

Applied Results at a Glance

Comparison of Results over Time

Percentage of All Students at or Above the Provincial Standard²

2000–2001 (# = 41 708)	2001–2002 (# = 47 220)	2002–2003 (# = 48 426)	2003–2004 (# = 50 430)
13%	21%	21%	26%



Observations

- 26% of the students in the applied program performed at or above the provincial standard.
- The percentage of students in the applied program performing at or above the provincial standard has increased this year after being stable the previous two years.

Students in the Grade 9 Academic Mathematics Program: All Students

Profile³

This section of the report provides information about the students who were in the Grade 9 academic mathematics program in 2003–2004.

Enrolment	Number	
Number of students in Grade 9 academic mathematics program	102 923	
Number of classes with students in Grade 9 academic mathematics program	4 150	
Number of schools with Grade 9 academic mathematics classes	667	
Semester	Number	Percentage
Students studying academic mathematics in a first-semester course	42 737	42%
Students studying academic mathematics in a second-semester course	41 979	41%
Students studying academic mathematics in a full-year course	18 207	18%
Gender	Number	Percentage
Female	52 104	51%
Male	49 916	48%
Gender not specified	903	1%
Student Status	Number	Percentage
ESL/ELD learners	2 471	2%
Identified as students with special needs	3 563	3%
School Background	Number	Percentage
Attended three or more elementary schools from kindergarten to Grade 8	35 353	34%
Language	Number	Percentage
Speak only or mostly a language other than English at home	8 741	8%
Speak English as often as another language at home	12 709	12%

Observations

- 83% of the students in the academic program were in a semestered program; 18% were in a full-year program.
- One-fifth of the students in the academic program spoke only or mostly English or spoke another language as often as English at home.
- The percentage of students indicating that they had attended three or more elementary schools increased from 29% last year to 34% this year.

Participation

This section of the report provides information about the students in the academic mathematics program who participated in the Grade 9 Assessment of Mathematics, 2003–2004.

Number of students in Grade 9 academic mathematics program	102 923	
	Number	Percentage
Participating students⁴	101 424	99%
Students who did not provide sufficient work to be scored (NEIS)⁵	868	1%
Students from whom EQAO did not receive completed assessment booklets (No Data)⁶	1 169	1%
Students who were exempted⁷	330	<1%
Students who received one or more accommodations⁸	2 331	2%
Students who received one or more special provisions⁹	1 565	2%

Results¹⁰

Grade 9 Students in the Academic Program

	# = 102 923	
	Number	Percentage
Level 4*	6 291	6%
Level 3*	63 950	62%
Level 2	17 588	17%
Level 1	12 400	12%
Below Level 1	327	<1%
NEIS	868	1%
No Data	1 169	1%
Exempt	330	<1%

*Achievement at or above the provincial standard

Observations

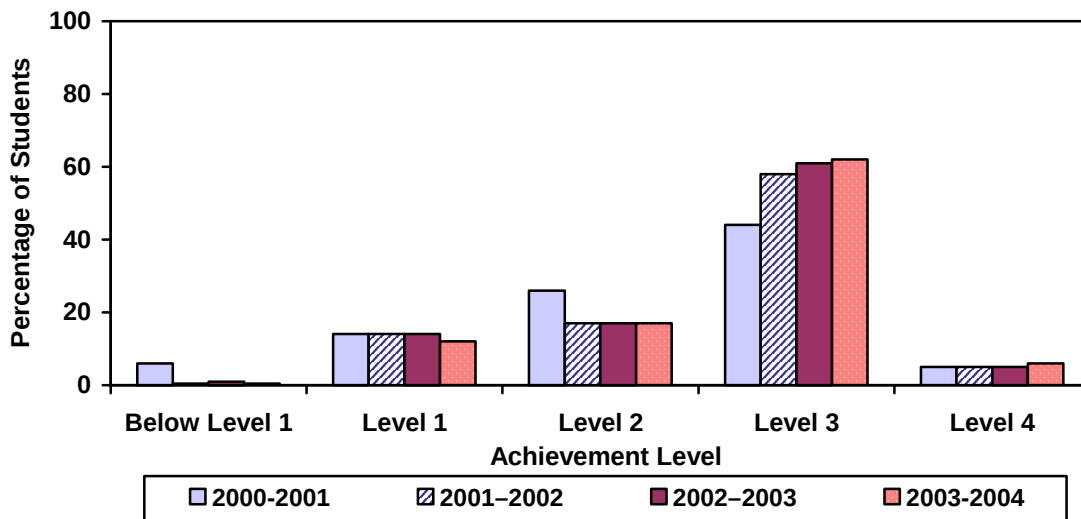
- 68% of the students in the academic program performed at or above the provincial standard.
- 29% of the students in the academic program achieved Level 1 or 2.

Comparison of Results over Time

Trends in Grade 9 Academic Mathematics

		2000–2001 # = 95 312	2001–2002 # = 99 094	2002–2003 # = 100 717	2003–2004 # = 102 923
Percentage of Students	Level 4	5%	5%	5%	6%
	Level 3	44%	58%	61%	62%
	Level 2	26%	17%	17%	17%
	Level 1	14%	14%	14%	12%
	Below Level	6%	<1%	1%	<1%
	NEIS	3%	3%	<1%	1%
	No Data	1%	1%	2%	1%
	Exempt	1%	<1%	<1%	<1%
At or Above the Provincial Standard*		49%	64%	66%	68%

*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.



Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- There has been a slow but steady increase in the percentage of students in the academic program performing at or above the provincial standard over the past three years.
- The percentage of academic students at Level 4 has remained relatively stable over the past four years.
- There has been a slow but steady increase in the percentage at Level 3 over the past three years.

- The percentage of students in the academic program performing at Level 2 has remained constant over the past three years.
- There has been a reduction in the percentage at Level 1 after after it was stable the previous three years.
- The percentage of students in the academic program performing Below Level 1 has remained relatively stable over the past three years.
- The percentage who provided insufficient work to be scored (NEIS) has remained low at 1% this year.
- The percentage of students in the academic program from whom EQAO did not receive completed assessment booklets (No Data) has remained stable over the past four years.
- The percentage exempted has remained stable at <1% over the past three years.

Students by Semester/Full Year

Participation

Number of Grade 9 students in the academic mathematics program		
First semester	42 737	
Second semester	41 979	
Full year	18 207	
Students who participated	Number	Percentage
First semester	42 110	99%
Second semester	41 399	99%
Full year	17 915	98%
Students who did not provide sufficient work to be scored (NEIS)	Number	Percentage
First semester	446	1%
Second semester	256	1%
Full year	166	1%
Students from whom EQAO did not receive completed assessment booklets (No Data)	Number	Percentage
First semester	463	1%
Second semester	436	1%
Full year	270	1%
Students who were exempted	Number	Percentage
First semester	164	<1%
Second semester	144	<1%
Full year	22	<1%

Observation

- Almost all (98–99%) of the students in the academic program participated in the assessment, whether they were in the first-semester, second-semester or full-year program.

Results¹¹

Grade 9 Students in the Academic Program

	First Semester # = 42 737		Second Semester # = 41 979		Full Year # = 18 207	
	Number	Percentage	Number	Percentage	Number	Percentage
Level 4*	2 532	6%	2 472	6%	1 287	7%
Level 3*	25 913	61%	26 767	64%	11 270	62%
Level 2	7 214	17%	7 394	18%	2 980	16%
Level 1	5 799	14%	4 442	11%	2 159	12%
Below Level 1	206	<1%	68	<1%	53	<1%
NEIS	446	1%	256	1%	166	1%
No Data	463	1%	436	1%	270	1%
Exempt	164	<1%	144	<1%	22	<1%

*Achievement at or above the provincial standard

Observations

- The percentage of students in the academic program performing at or above the provincial standard was about the same for students in the second-semester program (70%) as the full-year program (69%).
- 67% of academic-program students in the first-semester program performed at or above the provincial standard.
- The percentages at Levels 1 and 2 were about the same for students in the second-semester program (28%**) as the full-year program (28%).
- 30%** of academic-program students in the first-semester program performed at or above the provincial standard.

**These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 1 and 2.

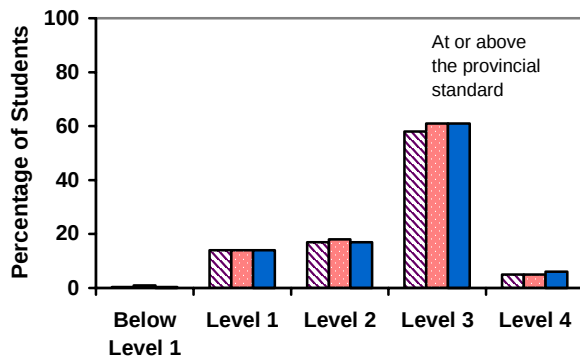
Comparison of Results over Time

Trends in Grade 9 Academic Mathematics Program

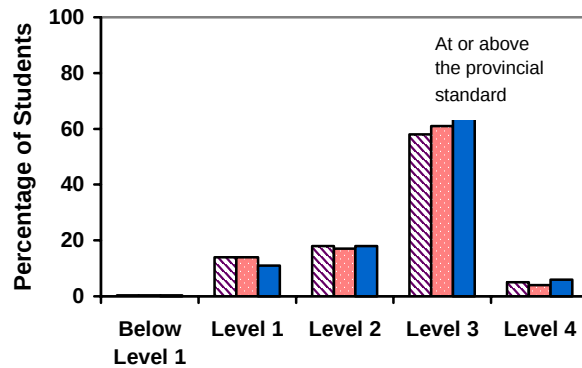
		2001–2002			2002–2003			2003–2004		
		First Semester # = 40 865	Second Semester # = 30 198	Full Year # = 12 265	First Semester # = 42 322	Second Semester # = 40 310	Full Year # = 18 082	First Semester # = 42 737	Second Semester # = 41 979	Full Year # = 18 207
Percentage of Students	Level 4	5%	5%	8%	5%	4%	6%	6%	6%	7%
	Level 3	58%	58%	59%	61%	61%	59%	61%	64%	62%
	Level 2	17%	18%	15%	18%	17%	15%	17%	18%	16%
	Level 1	14%	14%	12%	14%	14%	14%	14%	11%	12%
	Below	<1%	<1%	<1%	1%	<1%	1%	<1%	<1%	<1%
	NEIS	3%	3%	4%	<1%	<1%	<1%	1%	1%	1%
	No Data	1%	2%	1%	1%	2%	5%	1%	1%	1%
	Exempt	1%	<1%	<1%	1%	<1%	<1%	<1%	<1%	<1%
At or Above the Provincial Standard*		63%	63%	67%	66%	65%	65%	67%	70%	69%

*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

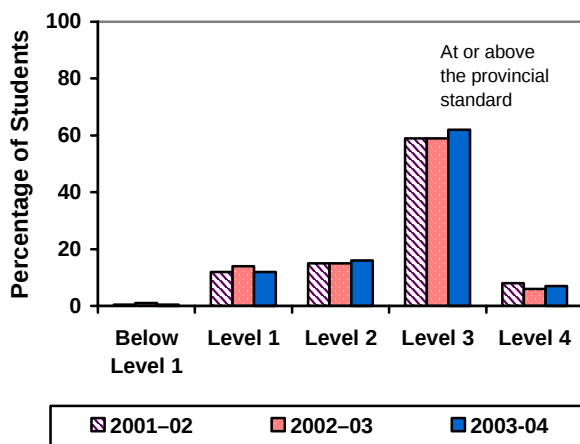
First Semester



Second Semester



Full Year



Observations

- The percentage of academic-program students in the first-semester program performing at or above the provincial standard has been relatively stable the past two years.
- The percentage of academic-program students in the second-semester program performing at or above the provincial standard has increased over the past three years.
- The percentage of academic-program students in the full-year program performing at or above the provincial standard has varied over the past three years.
- The percentage of academic-program students in the first-semester program at Level 1 or 2 has remained stable over the past three years.
- The percentage of academic-program students in the second-semester program at Level 1 or 2 decreased from the previous two years.
- The percentage of academic-program students in the full-year program at Level 1 or 2 has varied over the past three years.

Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Students by Gender

Participation

Number of Grade 9 students in the academic program		
Female	52 104	
Male	49 916	
Participating students	Number	Percentage
Female	51 380	99%
Male	49 220	99%
Students who did not provide sufficient work to be scored (NEIS)	Number	Percentage
Female	354	1%
Male	499	1%
Students from whom EQAO did not receive completed assessment booklets (No Data)	Number	Percentage
Female	565	1%
Male	529	1%
Students who were exempted	Number	Percentage
Female	159	<1%
Male	167	<1%

Observation

- Almost all (99%) male and female students in the academic program participated in the assessment.

Results¹²

Grade 9 Students in the Academic Program

	Female # = 52 104		Male # = 49 916	
	Number	Percentage	Number	Percentage
Level 4*	3 311	6%	2 932	6%
Level 3*	32 286	62%	31 170	62%
Level 2	9 011	17%	8 442	17%
Level 1	6 271	12%	6 004	12%
Below	147	<1%	173	<1%
NEIS	354	1%	499	1%
No Data	565	1%	529	1%
Exempt	159	<1%	167	<1%

*Achievement at or above the provincial standard

Observations

- An equal percentage (68%) of male and female students in the academic program performed at or above the provincial standard.
- An equal percentage (29%) of male and female students in the academic program performed at Level 1 or 2.

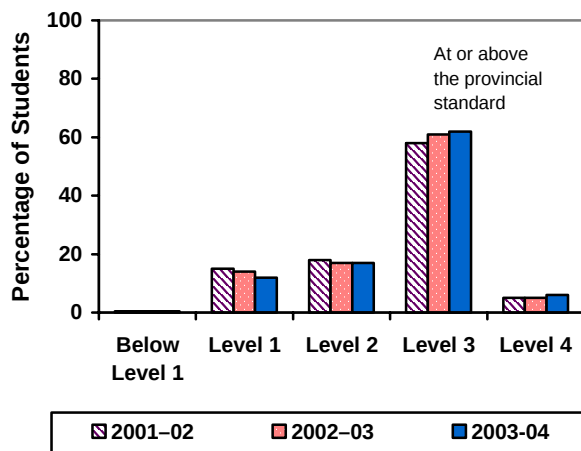
Comparison of Results over Time

Trends in Grade 9 Academic Mathematics

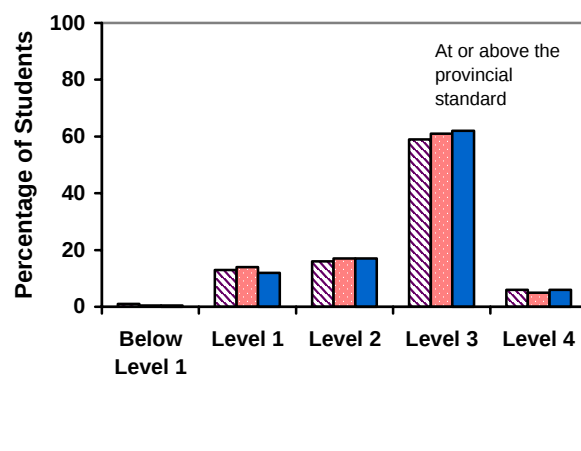
		2001–2002		2002–2003		2003–2004	
		Female # = 49 772	Male # = 48 181	Female # = 51 352	Male # = 48 750	Female # = 52 104	Male # = 49 916
Percentage of Students	Level 4	5%	6%	5%	5%	6%	6%
	Level 3	58%	59%	61%	61%	62%	62%
	Level 2	18%	16%	17%	17%	17%	17%
	Level 1	15%	13%	14%	14%	12%	12%
	Below Level 1	<1%	1%	<1%	<1%	<1%	<1%
	NEIS	3%	3%	<1%	<1%	1%	1%
	No Data	1%	1%	2%	2%	1%	1%
	Exempt	<1%	1%	<1%	1%	<1%	<1%
At or Above the Provincial Standard*		63%	65%	66%	66%	68%	68%

*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

Female



Male

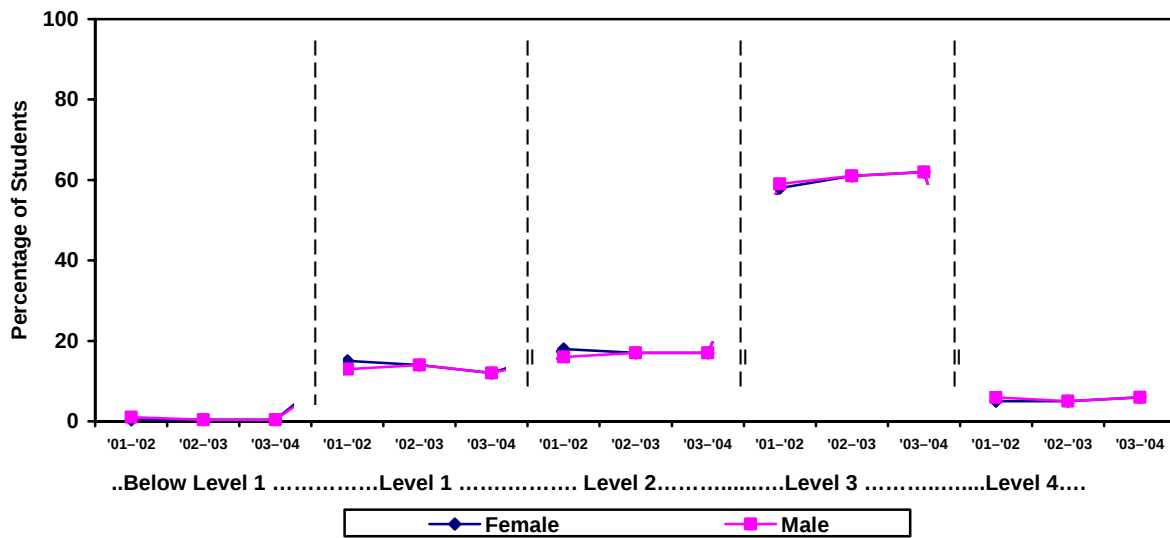


Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentages of female and male students in the academic program performing at or above the provincial standard have increased over the past three years.
- Over the past three years, the percentages of female and male students in the academic program performing at Level 4 and Level 2 have remained relatively stable and the percentages at Level 3 have increased. The percentage of female students at Level 1 has decreased, while the percentage of male students at Level 1 has varied.

Gap Analysis of Grade 9 Academic Mathematics: Percentage of Females and Males at Each Level



Observations

- The graph indicates little or no gender gap in Grade 9 academic mathematics achievement.
- The gender gap has narrowed and shows no difference at all levels over the past two years.

English as a Second Language/English Literacy Development Learners¹³

Participation

Number of ESL/ELD learners in the Grade 9 academic mathematics program	2471	
	Number	Percentage
ESL/ELD learners who participated	2236	90%
ESL/ELD learners who did not provide sufficient work to be scored (NEIS)	34	1%
ESL/ELD learners from whom EQAO did not receive completed assessment booklets (No Data)	30	1%
ESL/ELD learners who were exempted	205	8%

Observations

- A large percentage of the ESL/ELD learners in the academic program participated in the assessment. This is an increase of 3% compared to last year.
- 8% of the ESL/ELD learners in the academic program were exempted, compared to 11% last year.

Results¹⁴

	ESL/ELD # = 2471	
	Number	Percentage
Level 4*	170	7%
Level 3*	1117	45%
Level 2	382	15%
Level 1	486	20%
Below Level 1	47	2%
NEIS	34	1%
No Data	30	1%
Exempt	205	8%

*Achievement at or above the provincial standard

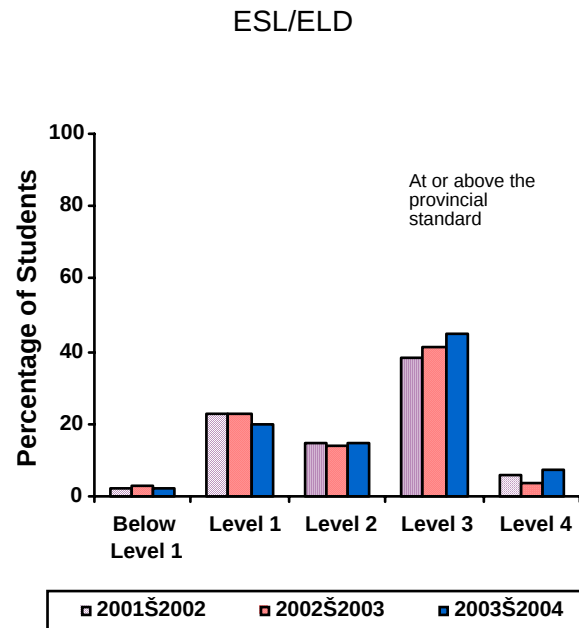
Observations

- More than half (52%) of the ESL/ELD learners in the academic program performed at or above the provincial standard.
- 35% of ESL/ELD learners in the academic program performed at Level 1 or 2.

Comparison of Results over Time

Trends in Grade 9 Academic Mathematics

		ESL/ELD		
		2001–2002 # = 2693	2002–2003 # = 3045	2003–2004 # = 2471
Percentage of Students	Level 4	6%	4%	7%
	Level 3	38%	41%	45%
	Level 2	15%	14%	15%
	Level 1	23%	23%	20%
	Below Level 1	2%	3%	2%
	NEIS	3%	1%	1%
	No Data	1%	2%	1%
	Exempt	12%	11%	8%
At or Above the Provincial Standard*		44%	45%	52%



*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentage of ESL/ELD learners in the academic program performing at or above the provincial standard improved greatly this year after having been relatively stable the previous two years.
- Over the past three years, the percentage of ESL/ELD learners in the academic program at Level 4 has varied, the percentage at Level 3 has increased and that at Level 2 has remained relatively stable.
- This year there has been a reduction in the percentage of ESL/ELD learners in the academic program at Level 1 compared to the previous two years.
- The percentage of ESL/ELD learners in the academic program who did not provide sufficient work to be scored (NEIS) has remained stable over the past two years.
- The percentage from whom EQAO did not receive completed assessment booklets (No Data) has remained relatively stable over the past three years.
- The percentage who were exempted has decreased.

Students with Special Needs¹⁵

Participation

Number of students with special needs in the Grade 9 academic mathematics program	3563	
	Number	Percentage
Students with special needs who participated	3453	97%
Students with special needs who did not provide sufficient work to be scored (NEIS)	64	2%
Students with special needs from whom EQAO did not receive	74	2%
Students with special needs who were exempted	36	1%

Observations

- A large percentage of the students with special needs in the academic program participated in the assessment. This is somewhat consistent with last year, when 96% participated.

Results¹⁶

Special Needs (excluding gifted) # = 3563		
	Number	Percentage
Level 4*	91	3%
Level 3*	1688	47%
Level 2	747	21%
Level 1	825	23%
Below Level 1	38	1%
NEIS	64	2%
No Data	74	2%
Exempt	36	1%

*Achievement at or above the provincial standard.

Observations

- Half the students with special needs in the academic program performed at or above the provincial standard.
- 44% of the students with special needs in the academic program performed at Level 1 or 2.

Comparison of Results over Time

Trends in Grade 9 Academic Mathematics

		Special Needs (excluding gifted)		
		2001–2002 # = 2386	2002–2003 # = 4181	2003–2004 # = 3563
Percentage of Students	Level 4	2%	3%	3%
	Level 3	41%	47%	47%
	Level 2	22%	20%	21%
	Level 1	26%	24%	23%
	Below Level 1	2%	1%	1%
	NEIS	4%	1%	2%
	No Data	2%	2%	2%
	Exempt	2%	2%	1%
At or Above the Provincial Standard*		43%	50%	50%

Special Needs



*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentage of students with special needs in the academic program performing at or above the provincial standard has been stable the past two years.
- Over the past three years, the percentage at Level 4 has remained relatively stable, the percentage at Level 2 has varied, and the percentage at Level 1 has decreased.
- The percentage of students with special needs in the academic program at Level 3 has remained stable the past two years.
- The percentage of students with special needs in the academic program who did not provide sufficient work to be scored (NEIS) has remained relatively stable over the past two years.
- The percentage from whom EQAO did not receive completed assessment booklets (No Data) has remained stable over the past two years.
- The percentage who were exempted has remained relatively stable the past three years.

Students' Learning Environment¹⁷

All Grade 9 Students in the Academic Program	Completed Questionnaires	Response Rate
102 923	100 458	98%

Student Attitudes Toward Mathematics	Percentage of Grade 9 students in the academic program indicating that	All (# = 100 458)	Female (# = 50 948)	Male (# = 48 698)
	they like mathematics	51%	46%	55%
	they think they are good at mathematics	51%	44%	57%
	they think they understand most of the mathematics they are taught	72%	69%	75%
	they think the mathematics they learn now is very useful for everyday life	37%	34%	41%
	they think they need to keep taking mathematics for the kind of job they want after they leave school	57%	54%	60%
	they think mathematics is boring	33%	32%	34%
	they think mathematics is an easy subject	27%	21%	32%

Observation

- A larger percentage of male students than female students in the academic program reported each of the following: that they like mathematics, that they are good at mathematics, that they understand most of the mathematics they are taught, that they need to keep taking mathematics for the kind of job they want after they leave school and that they think mathematics is an easy subject.

Student Computer and Calculator Use	Percentage of Grade 9 students in the academic program indicating that	All (# = 100 458)	Female (# = 50 948)	Male (# = 48 698)
	they have a computer at home that they use for school work	95%	96%	94%
	they have a scientific calculator at home that they use for school work	86%	87%	84%
	they have a graphing calculator at home that they use for school work	7%	6%	7%

Observations

- 95% of the students in the academic program indicated that they had computers at home that they used for school work.

Homework	Percentage of Grade 9 students in the academic program indicating that they spend the following amount of time on mathematics homework on any given day:	All (# = 100 458)	Female (# = 50 948)	Male (# = 48 698)
	more than 45 minutes	20%	23%	17%
	between 31 and 45 minutes	37%	40%	33%
	30 minutes or less	40%	34%	46%
	not assigned any mathematics homework	3%	2%	3%
	no response	1%	<1%	1%
	Percentage of Grade 9 students in the academic program indicating that they complete all of their homework	All (# = 100 458)	Female (# = 50 948)	Male (# = 48 698)
	never or seldom	9%	7%	12%
	Sometimes	23%	21%	25%
	often or always	67%	72%	62%
	no response	1%	<1%	1%

Observations

- 97% of the students in the academic program indicated that they were assigned mathematics homework.
- Two-fifths of the students in the academic program reported that they spend 30 minutes or less on mathematics homework.
- A larger percentage of the female (63%) than the male students (50%) indicated that they spent more than 30 minutes on mathematics homework.
- A larger percentage of the female (72%) than the male students (62%) indicated that they often or always completed all of their homework.

Student Attendance	Percentage of students indicating that this year they have been absent from their Grade 9 academic mathematics class	All (# = 100 458)	Female (# = 50 948)	Male (# = 48 698)
	never	13%	11%	15%
	1–4 times	57%	57%	56%
	5–9 times	20%	21%	18%
	10 or more times	8%	8%	8%
	No response	3%	2%	3%
	Percentage of students indicating that this year they have been late for their Grade 9 academic mathematics class	All (# = 100 458)	Female (# = 50 948)	Male (# = 48 698)
	never	47%	47%	47%
	1–4 times	38%	38%	37%
	5–9 times	8%	8%	8%
	10 or more times	5%	5%	6%
	No response	2%	2%	2%

Observations

- 86% of the female students and 82% of the male students in the academic program reported an absence from mathematics class.
- An equal percentage (51%) of the female and the male students in the academic program reported being late for mathematics class.

Teachers' Professional Learning Environment¹⁸

Note: Each teacher had to complete one questionnaire, so teacher responses are based on one class only. A teacher who taught both applied and academic classes chose one class and therefore one program.

Accessibility of Computers	Percentage of teachers who taught academic classes indicating the following numbers of computers available <i>in their classroom</i> for mathematics instruction for their Grade 9 students:	All (# = 2225)
	one computer for every student	3%
	one computer for every two students	4%
	one computer for more than two students	5%
	one computer only	16%
	no computers	72%
	no response	<1%
	Percentage of teachers who taught academic classes indicating the following numbers of computers available <i>in their school</i> for mathematics instruction for their Grade 9 students:	All (# = 2225)
	one computer for every student	61%
	one computer for every two students	22%
	one computer for more than two students	15%
	one computer only	<1%
	no computers	2%
	no response	1%

Observations

- 72% of the teachers who reported on academic classes reported that no computers were available in their classroom for mathematics instruction for their Grade 9 students.
- 61% of the teachers who reported on academic classes reported that one computer for every student was available in their school for mathematics instruction for their Grade 9 students.

	Percentage of teachers who taught academic classes indicating that they and/or their Grade 9 mathematics students used computers to do the following:	(# = 2225)			
		Seldom or Never	Sometimes	Often or Very Often	No Response
Computer Use	General computer use:				
	practice drills	89%	7%	3%	2%
	simulate situations	79%	16%	2%	2%
	demonstrate concepts or ideas	67%	28%	4%	2%
	explore and investigate mathematical ideas and relationships	60%	33%	6%	2%
	make presentations by teachers	81%	13%	4%	2%
	make presentations by students	92%	5%	1%	2%
	Software use:				
	build spreadsheets for the investigation of mathematical ideas and relationships	85%	12%	2%	2%
	run dynamic geometry software (e.g., The Geometre's Sketchpad, Cabri)	56%	34%	9%	1%
	run graphing software	74%	19%	5%	2%
	run statistical software	90%	6%	2%	2%
	run remedial software	93%	4%	1%	2%
	run word-processing software	77%	9%	12%	2%
	collect data, using probes	85%	11%	2%	2%
	explore the Internet	81%	11%	7%	2%

Observations

- 32% of the teachers who reported on academic classes indicated that they and/or their Grade 9 mathematics students used computers to demonstrate concepts or ideas at least sometimes.
- 39% of the teachers who reported on academic classes indicated that they and/or their Grade 9 mathematics students used computers to explore and investigate mathematical ideas and relationships at least sometimes.
- 43% of the teachers who reported on academic classes indicated that they and/or their Grade 9 mathematics students used computers to run dynamic geometry software at least sometimes.

Accessibility of Graphing Calculators	Percentage of teachers who taught academic classes indicating the following numbers of graphing calculators available <i>in their classroom</i> for mathematics instruction for their Grade 9 students:	All (# = 2225)
	one graphing calculator for every student	58%
	one graphing calculator for every two students	6%
	one graphing calculator for more than two students	3%
	one graphing calculator only	4%
	no graphing calculators	25%
	no response	3%
	Percentage of teachers who taught academic classes indicating the following numbers of graphing calculators available <i>in their school</i> for mathematics instruction for their Grade 9 students:	All (# = 2225)
	one graphing calculator for every student	74%
	one graphing calculator for every two students	9%
	one graphing calculator for more than two students	12%
	one graphing calculator only	<1%
	no graphing calculators	1%
	no response	3%

Observations

- 58% of the teachers who reported on academic classes reported that one graphing calculator for every student was available in their classroom for mathematics instruction for their Grade 9 students; one-quarter reported that no graphing calculators were available in their classroom for their Grade 9 students.
- 74% of the teachers who reported on academic classes reported that one computer for every student was available in their school for mathematics instruction for their Grade 9 students.

Calculator Use	Percentage of teachers who taught academic classes indicating that they and/or their Grade 9 mathematics students used graphing calculators to do the following:	(# = 2225)			
		Seldom or Never	Sometimes	Often or Very Often	No Response
	do basic mathematical operations	59%	23%	16%	2%
	simulate situations	44%	39%	16%	2%
	explore and investigate mathematical ideas and relationships	22%	50%	27%	1%
	collect data, using probes (e.g., CBR, CBL)	54%	36%	8%	2%

Observations

- 77% of the teachers who reported on academic classes indicated that they and/or their Grade 9 mathematics students used graphing calculators to explore and investigate mathematical ideas and relationships at least sometimes.
- 55% of the teachers who reported on academic classes indicated that they and/or their Grade 9 mathematics students used graphing calculators to simulate situations at least sometimes.

	Percentage of teachers who taught academic classes indicating that they had their Grade 9 mathematics students do the following:	(# = 2225)			
		Seldom or Never	Sometimes	Often or Very Often	No Response
Instructional Practices	discuss and use problem-solving strategies for finding answers (e.g., work backward, use a chart, make a model)	11%	38%	49%	2%
	use concrete materials to investigate and understand new concepts	29%	45%	24%	1%
	solve open-ended problems	23%	47%	29%	2%
	work collaboratively to solve problems	10%	39%	49%	1%
	discuss mathematical ideas and relationships	3%	20%	75%	2%
	practise mental mathematics	20%	36%	43%	1%
	conduct mathematical investigations (e.g., to demonstrate the inquiry process)	16%	46%	37%	1%
	explain the reasoning behind their answers	2%	19%	78%	1%
	write solutions using mathematical language and symbols	1%	6%	92%	1%
	demonstrate a mathematical process to others	41%	32%	25%	1%
	use the Internet to find secondary data	88%	9%	2%	1%

Observations

- A majority of the teachers who reported on academic classes indicated that they often or very often had their Grade 9 mathematics students write solutions using mathematical language and symbols (92%), explain the reasoning behind their answers (78%) and discuss mathematical ideas and relationships (75%).
- A majority of the teachers (88%) who reported on academic classes indicated that they seldom or never had their Grade 9 students use the Internet to find secondary data.

	Percentage of teachers who taught academic classes indicating that they used the following tools and strategies in assessing their Grade 9 mathematics students' progress in mathematics:	(# = 2225)			
		Never or Seldom	Sometimes	Often or Very often	No Response
Assessment Practices	observation notes and/or checklists	29%	36%	33%	2%
	meetings with individual students	40%	39%	19%	2%
	observations of students applying mathematical concepts to authentic real-life contexts	32%	41%	24%	2%
	dated work samples (portfolios)	64%	19%	15%	2%
	small diagnostic paper-and-pencil tests	11%	21%	67%	2%
	tests	<1%	10%	89%	1%
	quizzes	4%	20%	75%	1%
	investigations of mathematical concepts	15%	48%	35%	2%
	mathematics journals	78%	14%	7%	2%
	results of work done on the computer	77%	19%	3%	2%
	demonstrations of mental mathematics ability and estimation	54%	29%	15%	2%
	self-assessment	68%	25%	6%	1%
	peer assessment	78%	18%	3%	1%
	solution of open-ended questions	44%	39%	15%	2%
	student presentations to other students	73%	20%	6%	2%
	construction of physical or concrete models	76%	19%	3%	2%
	rubrics related to the achievement charts	44%	34%	21%	2%
	results of work done on a graphing calculator	36%	44%	18%	1%

Observations

- A majority of the teachers who reported on academic classes indicated that they often or very often used the following tools and strategies in assessing their Grade 9 students progress in mathematics: tests (89%), quizzes (75%) and small diagnostic paper-and-pencil tests (67%).
- A majority of the teachers who reported on academic classes indicated that they seldom or never used the following tools and strategies in assessing their Grade 9 students progress in mathematics: mathematics journals (78%), peer assessment (78%), results of work done on the computer (77%), construction of physical or concrete models (76%), student presentations to other students (73%), self-assessment (68%) and dated work samples or portfolios (64%).

Instructional Resources	Percentage of teachers who taught academic classes indicating the following accessibility and use of the instructional materials:	Accessible or Very Accessible ¹⁹ (# = 2225)	Often or Very Often Used (# = 2225)
	student textbooks	97%	91%
	other print resources	62%	61%
	manipulatives and concrete materials	36%	12%
	dynamic geometry software	41%	7%
	graphing software	44%	12%
	statistical software	28%	2%
	remedial software	14%	1%
	word-processing software	49%	10%
	linking software for graphing calculators	29%	4%
	presentation software	26%	2%
	spreadsheets	38%	3%
	teacher manuals	62%	24%
	data collection devices, probes and/or motion detectors	48%	7%
	EQAO support materials and investigations	61%	24%

Observations

- The teachers who reported on academic classes indicated that student textbooks and other print resources were the most accessible and most used instructional resources.
- 62% of the teachers who reported on academic classes indicated that teacher manuals were accessible or very accessible, while only 24% reported that they used teacher manuals often or very often.
- 61% of the teachers who reported on academic classes indicated that EQAO support materials and investigations were accessible or very accessible, while only 24% reported that they used these same materials often or very often.

Teachers' Background	Percentage of teachers who taught academic classes indicating their gender was	All (# = 2225)
	male	46%
	female	51%
	no response	3%

Observation

- 51% of the teachers who reported on academic classes reported they were female.

Teachers' Qualifications	Percentage of teachers who taught academic classes indicating their area of study while studying to obtain their bachelor's degree was	All (# = 2225)
	mathematics major	43%
	mathematics-related major (e.g., business, science, engineering, computer science, physics) with a mathematics minor	16%
	mathematics-related major (e.g., business, science, engineering, computer science, physics) with another subject as a minor	13%
	other subject as a major with a mathematics minor	11%
	other subject as a major with a mathematics-related minor	5%
	other	9%
	no response	3%

Observation

- 72% of the teachers who reported on academic classes indicated that their main area of study while studying to obtain their bachelor's degree was a mathematics major or a mathematics-related major.

Teachers' Experience	Percentage of teachers who taught academic classes indicating that they have been teaching	(# = 2225)				
		2 Years or Less	3–5 years	6–10 years	11 years or More	No Response
	mathematics at the secondary level	16%	20%	21%	41%	2%
	Grade 9 mathematics	26%	26%	19%	26%	2%

Observation

- 62% of the teachers who reported on academic classes reported teaching mathematics at the secondary level for more than five years; only 45% had been teaching Grade 9 mathematics for more than five years.

Teachers' Qualifications	Percentage of teachers who taught academic classes indicating that they had completed or were enrolled in	All (# = 2225)
	intermediate Additional Basic Qualifications in Mathematics	36%
	senior Additional Basic Qualifications in Mathematics	36%
	honour Specialist Qualification in Mathematics	31%

Observation

- 36% of the teachers who reported on academic classes indicated that they had completed or were enrolled in intermediate or senior additional basic qualifications in mathematics.

	Percentage of teachers who taught academic classes indicating that they have participated in the following sources of professional development:	(# = 2225)				
		Mathematics (e.g., Pure, Applied, Statistics)	Theories of Learning	Instructional Strategies	Assessment of Mathematics	Effective Use of Technology for Teaching Mathematics
Teachers' Professional Development	university or community college courses (including online courses)	48%	33%	34%	29%	22%
	seminars, workshops and conferences not offered by board, Ministry, university/college or EQAO	14%	16%	30%	27%	33%
	self-instruction or professional reading	42%	36%	48%	47%	47%
	collaboration with teachers in your school	39%	30%	67%	73%	61%
	collaboration with teachers from other schools	20%	18%	42%	47%	37%
	EQAO assessment activity	8%	3%	12%	23%	6%
	ministry-based activity	5%	5%	11%	15%	9%
	board-based activity	16%	21%	40%	46%	40%
	school-based activity	16%	21%	38%	43%	34%

Observation

- Professional development in instructional strategies, assessment of mathematics and effective use of technology for teaching mathematics was most common through collaboration with teachers in the school.

Grade 9 Academic Correlation Tables

Correlational analysis was used to examine the relationships among the Grade 9 achievement data and education quality indicators derived from the Grade 9 SIF and Student Questionnaire. The following tables present the strongest correlations. See Appendix A for the list, descriptions and sources of these variables.

Strongest Correlations Between Grade 9 Academic Mathematics Achievement and Education Quality Indicators Where $p < 0.01$

Indicator		Percentage at Level 2 or Above	Percentage at Level 3 or Above	Average Achievement Level
ESL/ELD	# = 666	−0.20	−0.13	−0.14
Access to home computer	# = 666	0.51	0.52	0.52
Access to scientific calculator	# = 666	0.27	0.32	0.32
Completion of homework	# = 666	0.22	0.28	0.28
Language spoken at home	# = 666	0.25	0.16	0.14
Late for class	# = 666	−0.36	−0.27	−0.33
Student Attitudes				
• think they are good at mathematics	# = 666	0.16	0.20	0.21
• think they understand most of the mathematics they are taught	# = 666	0.27	0.32	0.33
• think the mathematics they learn now is very useful for everyday life	# = 666	−0.23	−0.11	−0.10
• think they need to keep taking mathematics for the kind of job they want	# = 666	0.16	0.27	0.25

*For example, −0.20 means that the higher the percentage of ESL/ELD learners in a school, the lower the percentage of students at Level 2 or above in the school.

Grade 9 Applied Mathematics Program: All Students

Profile²⁰

This section of the report provides information about the students who were in the Grade 9 applied mathematics program in 2003–2004.

Enrolment	Number	
Number of students in Grade 9 applied mathematics program	50 430	
Number of classes with students in Grade 9 applied mathematics program	2 639	
Number of schools with Grade 9 applied mathematics classes	679	
Semester	Number	Percentage
Students studying applied mathematics in a first-semester course	22 103	44%
Students studying applied mathematics in a second-semester course	21 436	43%
Students studying applied mathematics in a full-year course	6 891	14%
Gender	Number	Percentage
Female	22 292	44%
Male	27 223	54%
Gender not specified	915	2%
Student Status	Number	Percentage
ESL or ELD learners	2 013	4%
Identified as students with special needs	12 269	24%
School Background	Number	Percentage
Attended three or more elementary schools from kindergarten to Grade 8	18 429	37%
Language	Number	Percentage
Speak only or mostly a language other than English at home	2 873	6%
Speak English as often as another language at home	4 819	10%

Observations

- 86% of the students in the applied program were in a semestered program; 14% were in a full-year program.
- There were more males than females in the applied mathematics program.
- Almost one-quarter of the students in the applied program were identified as students with special needs; only 3% of the students in the academic program were identified as students with special needs.
- 16% of the students in the applied program spoke only or mostly English or spoke another language as often as English at home.

Participation

This section of the report provides information about the students in the applied mathematics program who participated in the Grade 9 Assessment of Mathematics, 2003–2004.

Number of students in Grade 9 applied mathematics program	50 430	
	Number	Percentage
Participating students²¹	46 605	92%
Students who did not provide sufficient work to be scored (NEIS)²²	2 669	5%
Students from whom EQAO did not receive completed assessment booklets (No Data)²³	3 216	6%
Students who were exempted²⁴	609	1%
Students who received one or more accommodations²⁵	9 725	21%
Students who received one or more special provisions²⁶	1 532	3%

Results²⁷

Grade 9 Students in the Applied Program

	# = 50 430	
	Number	Percentage
Level 4*	182	<1%
Level 3*	12 694	25%
Level 2	18 650	37%
Level 1	8 487	17%
Below Level 1	3 923	8%
NEIS	2 669	5%
No Data	3 216	6%
Exempt	609	1%

*Achievement at or above the provincial standard

Observations

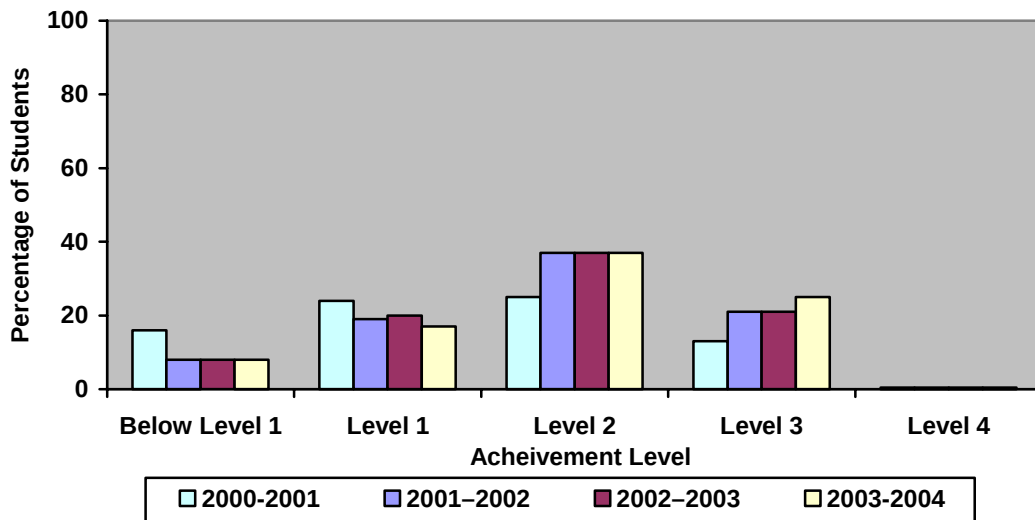
- 26% of the students in the applied program performed at or above the provincial standard.
- 54% of the students in the applied program performed at Level 1 or 2.

Comparison of Results over Time

Trends in Grade 9 Applied Mathematics

		2000–2001 # = 41 708	2001–2002 # = 47 220	2002–2003 # = 48 426	2003–2004 # = 50 430
Percentage of Students	Level 4	<1%	<1%	<1%	<1%
	Level 3	13%	21%	21%	25%
	Level 2	25%	37%	37%	37%
	Level 1	24%	19%	20%	17%
	Below Level 1	16%	8%	8%	8%
	NEIS	15%	6%	4%	5%
	No Data	6%	7%	8%	6%
	Exempt	3%	2%	2%	1%
At or Above the Provincial Standard*		13%	21%	21%	26%

*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.



Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentage of students in the applied program performing at or above the provincial standard increased this year after remaining stable the previous two years.
- The percentage at Level 4 has remained stable over the past four years.
- The percentage at Level 3 increased this year after remaining stable the previous two years.
- The percentage at Level 2 has remained constant over the past three years.
- The percentage at Level 1 has varied over the past four years.

- The percentage of students in the applied program performing Below Level 1 has remained stable over the past three years.
- The percentage who provided insufficient work to be scored (NEIS) increased slightly this year.
- The percentage from whom EQAO did not receive completed assessment booklets (No Data) decreased this year.
- The percentage of students in the applied program who were exempted decreased slightly this year.

Students by Semester/Full Year

Participation

Number of Grade 9 students in the applied mathematics program		
First semester	22 103	
Second semester	21 436	
Full year	6 891	
Students who participated	Number	Percentage
First semester	20 486	93%
Second semester	19 787	92%
Full year	6 332	92%
Students who did not provide sufficient work to be scored (NEIS)	Number	Percentage
First semester	1378	6%
Second semester	924	4%
Full year	367	5%
Students from whom EQAO did not receive completed assessment booklets (No Data)	Number	Percentage
First semester	1281	6%
Second semester	1415	7%
Full year	520	8%
Students who were exempted	Number	Percentage
First semester	336	2%
Second semester	234	1%
Full year	39	1%

Observations

- A large percentage of students in the applied program participated in the assessment, whether they were in the first-semester, second-semester or full-year program.
- A larger percentage in the full-year program participated this year (92%) than last year (85%).
- The percentage of students in the full-year program from whom EQAO did not receive completed assessment booklets (No Data) decreased from 13% last year to 8% this year.

Results²⁸

Grade 9 Students in the Applied Program

	First Semester # = 22 103		Second Semester # = 21 436		Full Year # = 6891	
	Number	Percentage	Number	Percentage	Number	Percentage
Level 4*	114	1%	53	<1%	15	<1%
Level 3*	5541	25%	5476	26%	1677	24%
Level 2	7920	36%	8231	38%	2499	36%
Level 1	3738	17%	3558	17%	1191	17%
Below Level 1	1795	8%	1545	7%	583	8%
NEIS	1378	6%	924	4%	367	5%
No Data	1281	6%	1415	7%	520	8%
Exempt	336	2%	234	1%	39	1%

Observations

- The percentage of applied-program students at or above the provincial standard was the same (26%) for students in the first semester as in the second semester.
- 25% of applied-program students in the full-year program performed at or above the provincial standard.
- The percentages at Levels 1 and 2 were the same (about 53%) for students in the first-semester as in the full-year program.
- 55% of applied-program students in the second semester performed at Level 1 or 2.

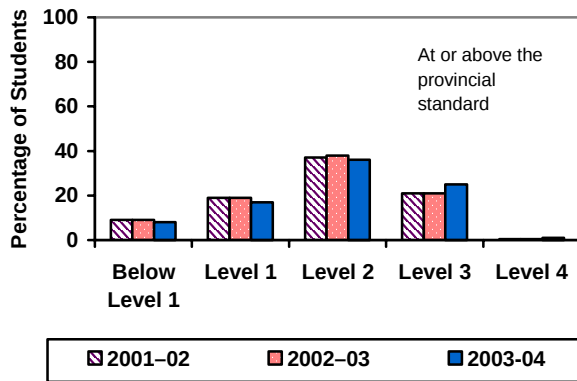
Comparison of Results over Time

Trends in Grade 9 Applied Mathematics Program

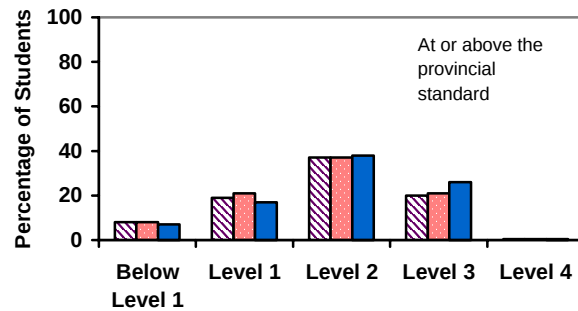
		2001–2002			2002–2003			2003–2004		
		First Semester # = 20 956	Second Semester # = 14 632	Full Year # = 4526	First Semester # = 21 032	Second Semester # = 20 927	Full Year # = 6464	First Semester # = 22 103	Second Semester # = 21 436	Full Year # = 6891
Percentage of Students	Level 4	<1%	<1%	<1%	<1%	<1%	<1%	1%	<1%	<1%
	Level 3	21%	20%	21%	21%	21%	19%	25%	26%	24%
	Level 2	37%	37%	34%	38%	37%	33%	36%	38%	36%
	Level 1	19%	19%	19%	19%	21%	20%	17%	17%	17%
	Below Level 1	9%	8%	8%	9%	8%	9%	8%	7%	8%
	NEIS	6%	6%	8%	4%	4%	4%	6%	4%	5%
	No Data	6%	7%	6%	6%	8%	13%	6%	7%	8%
	Exempt	2%	2%	3%	2%	2%	2%	2%	1%	1%
At or Above the Provincial Standard*		21%	20%	21%	21%	21%	19%	26%	26%	25%

*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

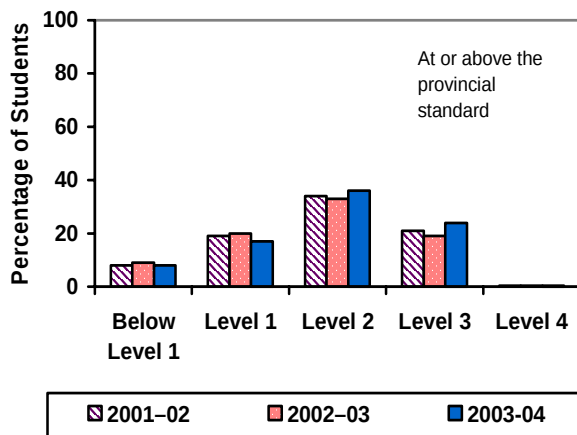
First Semester



Second Semester



Full Year



Observations

- The percentage of applied-program students in the first- and second-semester program performing at or above the provincial standard increased this year after having been relatively stable the previous two years.
- The percentage of applied-program students in the full-year program performing at or above the provincial standard has varied over the past three years; the best achievement was this year.
- The percentage of applied-program students in the first-semester program performing at Level 1 or 2 decreased this year compared to the previous two years.
- The percentage of applied-program students in the second-semester program at Level 1 or 2 decreased compared to last year.
- The percentage of applied-program students in the full-year program performing at Level 1 or 2 has remained stable over the past three years.

Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Students by Gender

Participation

Number of Grade 9 students in the applied program		
Female	22 292	
Male	27 223	
Participating students	Number	Percentage
Female	20 647	93%
Male	25 246	93%
Students who did not provide sufficient work to be scored (NEIS)	Number	Percentage
Female	1 052	5%
Male	1 553	6%
Students from whom EQAO did not receive completed assessment booklets (No Data)	Number	Percentage
Female	1 384	6%
Male	1 634	6%
Students who were exempted	Number	Percentage
Female	261	1%
Male	343	1%

Observation

- A large percentage of male and female students in the applied program participated in the assessment.

Results²⁹

Grade 9 Students in the Applied Program

	Female # = 22 292		Male # = 27 223	
	Number	Percentage	Number	Percentage
Level 4*	77	<1%	102	<1%
Level 3*	5581	25%	6 971	26%
Level 2	8302	37%	10 081	37%
Level 1	3902	18%	4 428	16%
Below	1733	8%	2 111	8%
NEIS	1052	5%	1 553	6%
No Data	1384	6%	1 634	6%
Exempt	261	1%	343	1%

Observations

- An almost equal percentage of male and female students in the applied program performed at or above the provincial standard.
- 55% of female students in the applied program achieved Level 1 or 2, while 53% of male students achieved Level 1 or 2.

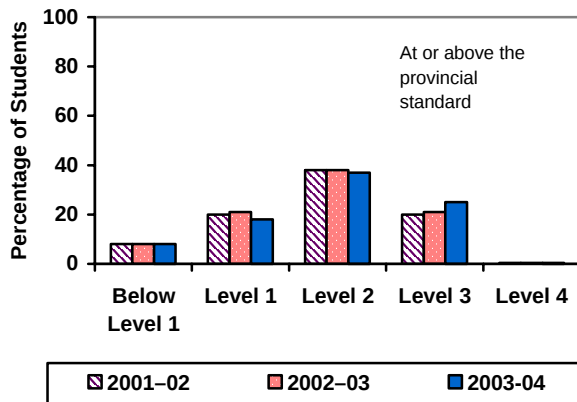
Comparison of Results over Time

Trends in Grade 9 Applied Mathematics

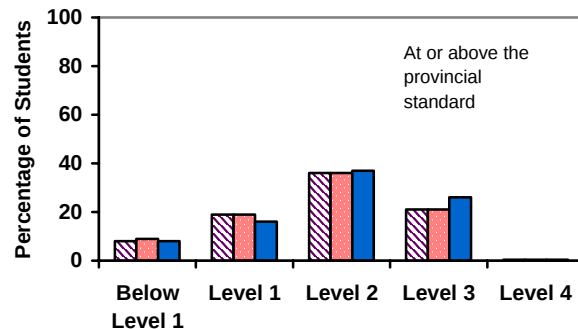
		2001–2002		2002–2003		2003–2004	
		Female # = 20 786	Male # = 25 615	Female # = 21 387	Male # = 26 625	Female # = 22 292	Male # = 27 223
Percentage of Students	Level 4	<1%	<1%	<1%	<1%	<1%	<1%
	Level 3	20%	21%	21%	21%	25%	26%
	Level 2	38%	36%	38%	36%	37%	37%
	Level 1	20%	19%	21%	19%	18%	16%
	Below Level 1	8%	8%	8%	9%	8%	8%
	NEIS	5%	7%	3%	5%	5%	6%
	No Data	6%	6%	7%	7%	6%	6%
	Exempt	2%	3%	2%	2%	1%	1%
At or Above the Provincial Standard*		20%	21%	21%	21%	25%	26%

*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

Female



Male

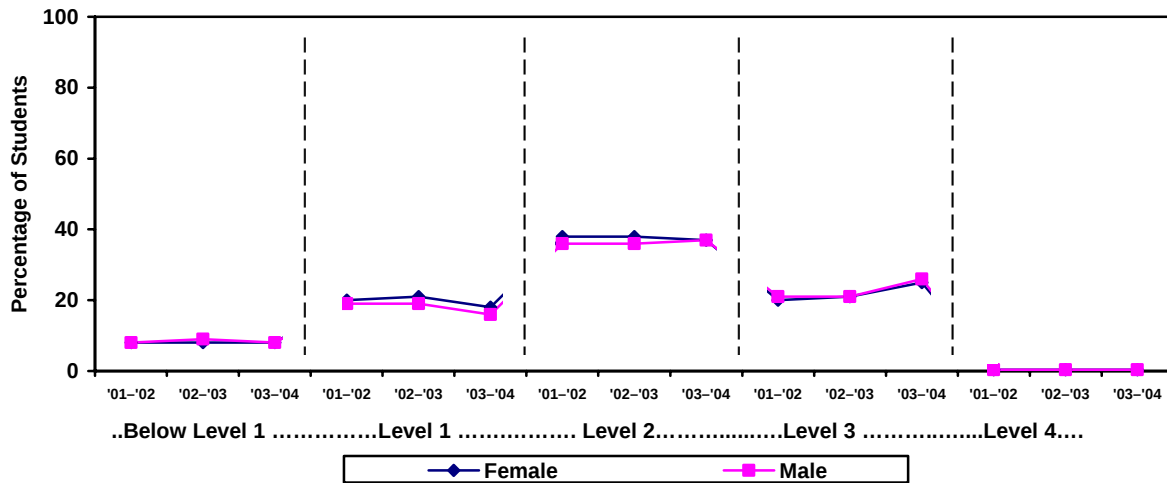


Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentages of female and male students in the applied program performing at or above the provincial standard increased this year after having been relatively stable the previous two years.
- Over the past three years, the percentages of female and male students in the applied program performing at Level 4 and Level 2 and Below Level 1 have remained relatively stable. The percentages of male and female students at Level 3 increased; the percentage of female students at Level 1 has varied; the percentage of male students at Level 1 decreased this year compared to the previous two years.

Gap Analysis of Grade 9 Applied Mathematics: Percentage of Females and Males at Each Level



Observations

- The graph indicates a very small gender gap in Grade 9 applied mathematics achievement, in favour of males.
- The gender gap at Level 2 in Grade 9 applied mathematics has narrowed.

English as a Second Language/English Literacy Development Learners³⁰

Participation

Number of ESL/ELD learners in Grade 9 applied mathematics program	2013	
	Number	Percentage
ESL/ELD learners who participated	1634	81%
ESL/ELD learners who did not provide sufficient work to be scored (NEIS)	104	5%
ESL/ELD learners from whom EQAO did not receive completed assessment booklets (No Data)	103	5%
ESL/ELD learners who were exempted	276	14%

Observations

- 81% of the ESL/ELD learners in the applied program participated in the assessment, compared to 79% last year.
- 14% of the ESL/ELD learners in the applied program were exempted; 8% of ESL/ELD learners in the academic program were exempted.

Results³¹

	ESL/ELD # = 2013	
	Number	Percentage
Level 4*	15	1%
Level 3*	229	11%
Level 2	448	22%
Level 1	429	21%
Below Level 1	409	20%
NEIS	104	5%
No Data	103	5%
Exempt	276	14%

*Achievement at or above the provincial standard

Observations

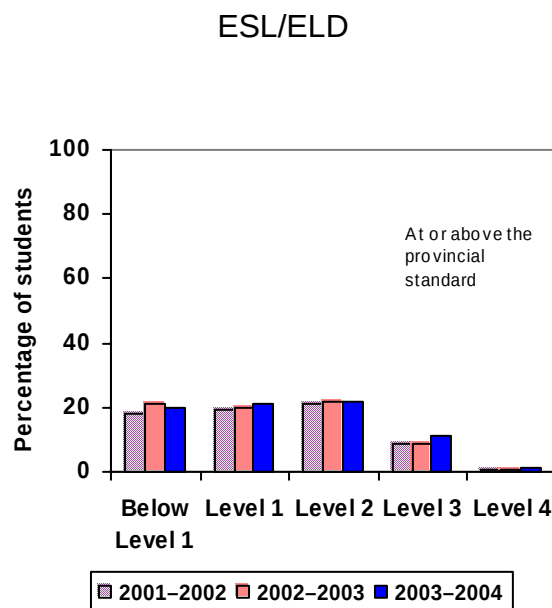
- 12% of the ESL/ELD learners in the applied program performed at or above the provincial standard.
- 44%** of the ESL/ELD learners in the applied program performed at Level 1 or 2.

**This percentage is based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 1 and 2.

Comparison of Results over Time

Trends in Grade 9 Applied Mathematics

		ESL/ELD		
		2001–2002 # = 2094	2002–2003 # = 2236	2003–2004 # = 2013
Percentage of Students	Level 4	<1%	<1%	1%
	Level 3	9%	9%	11%
	Level 2	21%	22%	22%
	Level 1	19%	20%	21%
	Below Level 1	18%	21%	20%
	NEIS	6%	6%	5%
	No Data	3%	6%	5%
	Exempt	23%	15%	14%
At or Above the Provincial Standard*		9%	9%	12%



*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentage of ESL/ELD learners in the applied program performing at or above the provincial standard increased this year after having been stable the previous two years.
- The percentages of ESL/ELD learners in the applied program at Level 4 and Level 3 increased this year compared to the previous two years.
- Over the past three years, the percentage of ESL/ELD learners in the applied program at Level 2 has remained relatively stable, the percentage at Level 1 has increased and the percentage Below Level 1 has varied.
- The percentage of ESL/ELD learners in the applied program who did not provide sufficient work to be scored (NEIS) has remained relatively stable over the past three years.
- The percentage from whom EQAO did not receive completed assessment booklets (No Data) has remained relatively stable over the past two years.
- The percentage who were exempted has remained relatively stable over the past two years after an initial 8% drop.

Students with Special Needs³²

Participation

Number of students with special needs in Grade 9 applied mathematics program	12 269	
	Number	Percentage
Students with special needs who participated	11 393	93%
Students with special needs who did not provide sufficient work to be scored (NEIS)	662	5%
Students with special needs from whom EQAO did not receive completed assessment booklets (No Data)	669	5%
Students with special needs who were exempted	207	2%

Observations

- 93% of the students with special needs in the applied program participated in the assessment, compared to 89% last year.
- 2% of the students with special needs in the applied program were exempted, compared to 4% last year.

Results³³

	Special Needs (excluding gifted) # = 12 269	
	Number	Percentage
Level 4*	31	<1%
Level 3*	2246	18%
Level 2	4272	35%
Level 1	2677	22%
Below Level 1	1505	12%
NEIS	662	5%
No Data	669	5%
Exempt	207	2%

*Achievement at or above the provincial standard

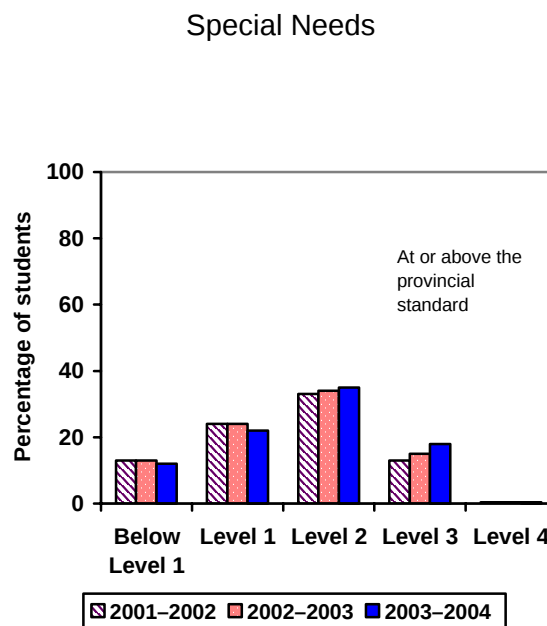
Observations

- 19% of the students with special needs in the applied program performed at or above the provincial standard.
- 57% of the students with special needs in the applied program performed at Level 1 or 2.

Comparison of Results over Time

Trends in Grade 9 Applied Mathematics

		Special Needs (excluding gifted)		
		2001–2002 # = 8869	2002–2003 # = 11 959	2003–2004 # = 12 269
Percentage of Students	Level 4	<1%	<1%	<1%
	Level 3	13%	15%	18%
	Level 2	33%	34%	35%
	Level 1	24%	24%	22%
	Below Level 1	13%	13%	12%
	NEIS	8%	4%	5%
	No Data	5%	6%	5%
	Exempt	5%	4%	2%
At or Above the Provincial Standard*		13%	15%	19%



*These percentages are based on the actual number of students and cannot be calculated simply by adding the (rounded) percentages of students at Levels 3 and 4.

Note: As bar graphs of data for all students do not show the exempt, no data and NEIS categories, percentages in these bar graphs will not add up to 100.

Observations

- The percentage of students with special needs in the applied program performing at or above the provincial standard has increased over the past three years.
- Over the past three years, the percentage at Level 4 has remained stable and the percentages at Level 3 and at Level 2 have increased.
- The percentage of students with special needs in the applied program at Level 1 and Below Level 1 decreased this year compared to the previous two years.
- The percentage who did not provide sufficient work to be scored (NEIS) has remained relatively stable over the past two years.
- The percentage from whom EQAO did not receive completed assessment booklets (No Data) has remained relatively stable over the past three years.
- The percentage who were exempted decreased this year.

Students' Learning Environment³⁴

All Grade 9 Students in the Applied Program	Completed Questionnaires	Response Rate
50 430	45 376	90%

Student Attitudes Toward Mathematics	Percentage of Grade 9 students in the applied program indicating:	All (# = 45 376)	Female (# = 20 188)	Male (# = 24 524)
	they like mathematics	32%	28%	36%
	they think they are good at mathematics	32%	25%	37%
	they think they understand most of the mathematics they	59%	55%	62%
	they think the mathematics they learn now is very useful for everyday life	38%	35%	40%
	they think they need to keep taking mathematics for the kind of job they want after they leave school	41%	37%	44%
	they think mathematics is boring	46%	47%	46%
	they think mathematics is an easy subject	19%	15%	23%

Observation

- A larger percentage of male students than female students in the applied program reported each of the following: that they like mathematics, that they are good at mathematics, that they understand most of the mathematics they are taught, that they need to keep taking mathematics for the kind of job they want after they leave school and that they think mathematics is an easy subject.

Student Computer and Calculator Use	Percentage of Grade 9 students in the applied program indicating that	All (# = 45 376)	Female (# = 20 188)	Male (# = 24 524)
	they have a computer at home that they use for school work	82%	85%	80%
	they have a scientific calculator at home that they use for school work	73%	76%	70%
	they have a graphing calculator at home that they use for school work	6%	6%	7%

Observation

- 82% of students in the applied program indicated that they had computers at home that they used for school work.

Homework	Percentage of Grade 9 students in the applied program indicating that they spend the following amounts of time on mathematics homework on any given day:	All (# = 45 376)	Female (# = 20 188)	Male (# = 24 524)
	more than 45 minutes	12%	13%	11%
	between 31 and 45 minutes	22%	26%	20%
	30 minutes or less	49%	47%	50%
	not assigned any mathematics homework	15%	13%	17%
	no response	2%	1%	2%
	Percentage of Grade 9 students in the applied program indicating that they complete all of their homework	All (# = 45 376)	Female (# = 20 188)	Male (# = 24 524)
	never or seldom	15%	12%	18%
	sometimes	32%	31%	32%
	often or always	52%	56%	49%
	no response	1%	1%	1%

Observations

- 83% of the students in the applied program indicated that they were assigned mathematics homework.
- Almost half the students in the applied program reported that they spend 30 minutes or less on mathematics homework.
- A larger percentage of the female (39%) than the male students (31%) indicated that they spent more than 30 minutes on mathematics homework.
- A larger percentage of the female (56%) than the male students (49%) indicated that they often or always completed all of their homework.

Student Attendance	Percentage of students indicating that this year they have been absent from their Grade 9 applied mathematics class	All (# = 45 376)	Female (# = 20 188)	Male (# = 24 524)
	never	9%	8%	11%
	1–4 times	44%	43%	44%
	5–9 times	23%	24%	22%
	10 or more times	19%	21%	18%
	no response	4%	4%	5%
	Percentage of students indicating that this year they have been late from their Grade 9 applied mathematics class	All (# = 45 376)	Female (# = 20 188)	Male (# = 24 524)
	never	30%	29%	30%
	1–4 times	39%	40%	38%
	5–9 times	15%	15%	14%
	10 or more times	13%	12%	14%
	no response	4%	4%	4%

Observations

- 88% of the female students and 84% of the male students in the applied program reported an absence from mathematics class.
- An almost equal percentage (about 67%) of the female and male students in the applied program reported having been late for mathematics class.

Teachers' Professional Learning Environment³⁵

Note: Each teacher had to complete one questionnaire, so teacher responses are based on one class only. A teacher who taught both applied and academic classes chose one class and therefore one program.

Accessibility of Computers	Percentage of teachers who taught applied classes indicating the following numbers of computers available <i>in their classroom</i> for mathematics instruction for their Grade 9 students:	All (# = 1456)
	one computer for every student	4%
	one computer for every two students	2%
	one computer for more than two students	5%
	one computer only	15%
	no computers	74%
	no response	<1%
	Percentage of teachers who taught applied classes indicating the following numbers of computers available <i>in their school</i> for mathematics instruction for their Grade 9 students:	All (# = 1456)
	one computer for every student	66%
	one computer for every two students	14%
	one computer for more than two students	16%
	one computer only	<1%
	no computers	2%
	no response	1%

Observations

- 74% of the teachers who reported on applied classes reported that no computers were available in their classroom for mathematics instruction for their Grade 9 students.
- 66% of the teachers who reported on applied classes reported that one computer for every student was available in their school for mathematics instruction for their Grade 9 students.

	Percentage of teachers who taught applied classes indicating that they and/or their Grade 9 mathematics students use computers to do the following:	(# = 1456)			
		Seldom or Never	Sometimes	Often or Very Often	No Response
Computer Use	General computer use:				
	practice drills	89%	6%	2%	2%
	simulate situations	83%	12%	2%	3%
	demonstrate concepts or ideas	74%	20%	4%	2%
	explore and investigate mathematical ideas and relationships	70%	25%	4%	2%
	make presentations by teachers	82%	13%	3%	2%
	make presentations by students	94%	3%	1%	2%
	Software use:				
	build spreadsheets for the investigation of mathematical ideas and relationships	89%	8%	1%	2%
	run dynamic geometry software (e.g., The Geometre's Sketchpad, Cabri)	68%	25%	5%	2%
	run graphing software	78%	16%	3%	3%
	run statistical software	92%	5%	1%	2%
	run remedial software	92%	5%	1%	2%
	run word-processing software	80%	9%	9%	2%
	collect data, using probes	87%	10%	1%	2%
	explore the Internet	79%	11%	8%	2%

Observations

- 24% of the teachers who reported on applied classes indicated that they and/or their Grade 9 mathematics students used computers to demonstrate concepts or ideas at least sometimes.
- 29% of the teachers who reported on applied classes indicated that they and/or their Grade 9 mathematics students used computers to explore and investigate mathematical ideas and relationships at least sometimes.
- 30% of the teachers who reported on applied classes indicated that they and/or their Grade 9 mathematics students used computers to run dynamic geometry software at least sometimes.

Accessibility of Graphing Calculators	Percentage of teachers who taught applied classes indicating the following numbers of graphing calculators available <i>in their classroom</i> for mathematics instruction for their Grade 9 students:	All (# = 1456)
	one graphing calculator for every student	58%
	one graphing calculator for every two students	5%
	one graphing calculator for more than two students	4%
	one graphing calculator only	3%
	no graphing calculators	29%
	no response	2%
	Percentage of teachers who taught applied classes indicating the following numbers of graphing calculators available <i>in their school</i> for mathematics instruction for their Grade 9 students:	All (# = 1456)
	one graphing calculator for every student	72%
	one graphing calculator for every two students	10%
	one graphing calculator for more than two students	12%
	one graphing calculator only	<1%
	no graphing calculators	2%
	no response	4%

Observations

- 58% of the teachers who reported on applied classes reported that one graphing calculator for every student was available in their classroom for mathematics instruction for their Grade 9 students; 29% reported that no graphing calculators were available in their classroom for their Grade 9 students.
- 72% of the teachers who reported on applied classes reported that one computer for every student was available in their school for mathematics instruction for their Grade 9 students.

Calculator Use	Percentage of teachers who taught applied classes indicating that they and/or their Grade 9 mathematics students use calculators to do the following:	(# = 1456)			
		Seldom or Never	Sometimes	Often or Very Often	No Response
	basic mathematical operations	58%	23%	17%	2%
	simulate situations	55%	33%	10%	2%
	explore and investigate mathematical ideas and relationships	37%	44%	17%	2%
	collect data, using probes (e.g., CBR, CBL)	65%	29%	5%	2%

Observations

- 61% of the teachers who reported on applied classes indicated that they and/or their Grade 9 mathematics students used graphing calculators to explore and investigate mathematical ideas and relationships at least sometimes.
- 43% of the teachers who reported on applied classes indicated that they and/or their Grade 9 mathematics students used graphing calculators to simulate situations at least sometimes.

Instructional Practices	Percentage of teachers who taught applied classes indicating that their Grade 9 mathematics students do the following:	(# = 1456)			
		Seldom or Never	Sometimes	Often or Very Often	No Response
	discuss and use problem-solving strategies for finding answers (e.g., work backward, use a chart, make a model)	14%	43%	41%	2%
	use concrete materials to investigate and understand new concepts	21%	47%	30%	2%
	solve open-ended problems	33%	48%	18%	2%
	work collaboratively to solve problems	11%	37%	50%	2%
	discuss mathematical ideas and relationships	6%	25%	67%	2%
	practise mental mathematics	21%	36%	42%	2%
	conduct mathematical investigations (e.g., to demonstrate the inquiry process)	22%	48%	28%	2%
	explain the reasoning behind their answers	5%	28%	65%	2%
	write solutions using mathematical language and symbols	3%	14%	81%	2%
	demonstrate a mathematical process to others	47%	29%	23%	2%
	use the Internet to find secondary data	89%	7%	2%	1%

Observations

- A majority of the teachers who reported on applied classes indicated that they often or very often have their Grade 9 mathematics students write solutions using mathematical language and symbols (81%), explain the reasoning behind their answers (65%) and discuss mathematical ideas and relationships (67%).
- A majority of the teachers (89%) who reported on applied classes indicated that they seldom or never have their Grade 9 students use the Internet to find secondary data.

	Percentage of teachers who taught applied classes indicating that they used the following tools and strategies in assessing their Grade 9 mathematics students' progress in mathematics:	(# = 1456)			
		Never or Seldom	Sometimes	Often or Very often	No Response
Assessment Practices	observation notes and/or checklists	25%	36%	36%	2%
	meetings with individual students	32%	38%	28%	2%
	observations of students applying mathematical concepts to authentic real-life contexts	29%	41%	28%	3%
	dated work samples (portfolios)	60%	21%	16%	3%
	small diagnostic paper-and-pencil tests	8%	21%	68%	2%
	tests	1%	18%	79%	2%
	quizzes	4%	19%	75%	2%
	investigations of mathematical concepts	20%	46%	31%	3%
	mathematics journals	81%	11%	6%	3%
	results of work done on the computer	84%	11%	2%	2%
	demonstrations of mental mathematics ability and estimation	50%	30%	16%	3%
	self-assessment	69%	21%	7%	2%
	peer assessment	78%	16%	4%	2%
	solution of open-ended questions	54%	35%	9%	2%
	student presentations to other students	78%	15%	4%	2%
	construction of physical or concrete models	67%	25%	6%	2%
	rubrics related to the achievement charts	45%	33%	20%	2%
	results of work done on a graphing calculator	50%	36%	12%	2%

Observations

- A majority of the teachers who reported on applied classes indicated that they often or very often use the following tools and strategies in assessing their Grade 9 students' progress in mathematics: tests (79%), quizzes (75%) and small diagnostic paper-and-pencil tests (68%).
- A majority of the teachers who reported on applied classes indicated that they seldom or never use the following tools and strategies in assessing their Grade 9 students' progress in mathematics: results of work done on the computer (84%), mathematics journals (81%), peer assessment (78%), student presentations to other students (78%), self-assessment (69%), construction of physical or concrete models (67%) and dated work samples or portfolios (60%).

Instructional Resources	Percentage of teachers who taught applied classes indicating accessibility and use of the following instructional materials:	Accessible or Very Accessible ³⁶ (# = 1456)	Often or Very Often Used (# = 1456)
	student textbooks	85%	76%
	other print resources	68%	71%
	manipulatives and concrete materials	38%	20%
	dynamic geometry software	36%	4%
	graphing software	41%	9%
	statistical software	24%	2%
	remedial software	14%	2%
	word-processing software	46%	8%
	linking software for graphing calculators	27%	3%
	presentation software	24%	2%
	spreadsheets	36%	3%
	teacher manuals	59%	31%
	data collection devices, probes and/or motion detectors	41%	6%
	EQAO support materials and investigations	52%	21%

Observations

- The teachers who reported on applied classes indicated that student textbooks and other print resources were the most accessible and most used instructional resources.
- 59% of the teachers who reported on applied classes indicated that teacher manuals were accessible or very accessible, while only 31% reported that they used teacher manuals often or very often.
- 52% of the teachers who reported on academic classes indicated that EQAO support materials and investigations were accessible or very accessible, while only 21% reported that they used these same materials often or very often.

Teachers' Background	Percentage of teachers who taught applied classes indicating their gender as	All (# = 1456)
	Male	51%
	Female	46%
	no response	3%

Observation

- 51% of the teachers who reported on applied classes reported they were male.

Teacher Background	Percentage of teachers who taught applied classes indicating their area of study while studying to obtain their bachelor's degree was	All (# = 1456)
	mathematics major	34%
	mathematics-related major (e.g., business, science, engineering, computer science, physics) with a mathematics minor	16%
	mathematics-related major (e.g., business, science, engineering, computer science, physics) with another subject as a minor	13%
	other subject as a major with a mathematics minor	10%
	other subject as a major with a mathematics-related minor	7%
	other	17%
	no response	3%

Observation

- 63% of the teachers who reported on applied classes indicated that their main area of study while studying to obtain their bachelor's degree was a mathematics major or mathematics-related major.

Teachers' Experience	Percentage of teachers who taught applied classes indicating that they have been teaching	(# = 1456)				
		2 Years or Less	3–5 years	6–10 years	11 years or More	No Response
	mathematics at the secondary level	25%	23%	16%	34%	2%
	Grade 9 mathematics	36%	25%	17%	20%	2%

Observation

- 50% of the teachers who reported on applied classes reported having taught mathematics at the secondary level for more than five years; only 37% had been teaching Grade 9 mathematics for more than five years.

Teachers' Qualifications	Percentage of teachers who taught applied classes indicating that they had completed or were enrolled in	All (# = 1456)
	intermediate Additional Basic Qualifications in Mathematics	32%
	senior Additional Basic Qualifications in Mathematics	30%
	honour Specialist Qualification in Mathematics	23%

Observation

- 32% of the teachers who reported on applied classes indicated that they had completed or were enrolled in intermediate additional basic qualifications in mathematics.

Teachers' Professional Development	Percentage of teachers who taught applied classes indicating that they have participated in the following sources of professional development:	(# = 1456)				
		Mathematics (e.g., Pure, Applied, Statistics)	Theories of Learning	Instructional Strategies	Assessment of Mathematics	Effective Use of Technology for Teaching Mathematics
	university or community college courses (including online courses)	44%	32%	33%	26%	21%
	seminars, workshops and conferences not offered by board, Ministry, university/college or EQAO	13%	16%	29%	25%	30%
	self-instruction or professional reading	38%	34%	48%	44%	42%
	collaboration with teachers in their school	38%	31%	66%	70%	54%
	collaboration with teachers from other schools	16%	17%	41%	42%	32%
	EQAO assessment activity	7%	3%	12%	20%	5%
	ministry-based activity	4%	5%	11%	13%	8%
	board-based activity	14%	19%	40%	42%	36%
	school-based activity	14%	19%	35%	39%	29%

Observations

- Professional development in instructional strategies, assessment of mathematics and effective use of technology for teaching mathematics was most common through collaboration with teachers in the school.

Grade 9 Applied Correlation Tables

Correlational analysis was used to examine the relationships among the Grade 9 achievement data and education quality indicators derived from the Grade 9 SIF and Student Questionnaire. The following tables present the strongest correlations.* See Appendix A for the list, descriptions and sources of these variables.

Strongest Correlations Between Grade 9 Applied Mathematics Achievement and Education Quality Indicators Where $p < 0.01$

Indicators		Percentage at Level 2 and Above	Percentage at Level 3 and Above	Average Achievement Level
ESL/ELD	# = 677	-0.30	-0.21	-0.29
Access to home computer	# = 677	0.36	0.22	0.36
Access to scientific calculator	# = 677	0.28	0.16	0.26
Completion of homework	# = 677	0.15	0.13	0.17
Language spoken at home	# = 677	0.32	0.19	0.30
Late for class	# = 677	-0.24	-0.19	-0.24
Student Attitudes				
• think they are good at mathematics	# = 677	0.14	0.20	0.17
• think they understand most of the mathematics they are taught	# = 677	0.18	0.25	0.22
• think the mathematics they learn now is very useful for everyday life	# = 677	-0.15	-0.14	-0.16
• think mathematics is an easy subject	# = 677	0.14	0.19	0.17

*For example, -0.30 means that the higher the percentage of ESL/ELD learners in a school, the lower the percentage of students at Level 2 or above in the school.

Appendix A

List of Indicators Used in Correlational Analysis

Indicator	Description	Source
Percentage at Level 2 or above	Percentage of students who have achieved Level 2 or above on mathematics assessment; reported separately for academic and applied	EQAO Grade 9 achievement results
Percentage of students at Level 3 or above	Percentage of students who have achieved Level 3 (provincial standard) or above on mathematics assessment; reported separately for academic and applied	EQAO Grade 9 achievement results
Average achievement level	School's composite mean level of achievement in mathematics; reported separately for academic and applied	EQAO Grade 9 achievement results
ESL/ELD	Percentage of Grade 9 students within a school identified as ESL/ELD learners on the SIF	EQAO Grade 9 SIF
Access to home computer	Percentage of students who reported there was a computer at home for them to use for school work	EQAO Grade 9 Student Questionnaire
Access to scientific calculator	Percentage of students who reported there was a scientific calculator at home for them to use for school work	EQAO Grades 9 Student Questionnaire
Completion of homework	Percentage of students who reported that they often or sometimes completed all of their mathematics homework	EQAO Grade 9 Student Questionnaire
Language spoken at home	Percentage of students who reported that they only or mostly speak English at home	EQAO Grade 9 Student Questionnaire
Late for class	Percentage of students who reported that they were late for mathematics class more than five times in the semester/year	EQAO Grade 9 Student Questionnaire
Student Attitudes—think they are good at mathematics	Percentage of students who reported that they strongly agree or agree that they are good at mathematics	EQAO Grade 9 Student Questionnaire
Student Attitudes—think they understand most of the mathematics they are taught	Percentage of students who reported that they strongly agree or agree that they understand most of the mathematics they are taught	EQAO Grade 9 Student Questionnaire
Student Attitudes—think the mathematics they learn now is very useful for everyday life	Percentage of students who reported that they strongly agree or agree that the mathematics they learn now is very useful for everyday life	EQAO Grade 9 Student Questionnaire

Student Attitudes—think they need to keep taking mathematics for the kind of job they want	Percentage of students who reported that they strongly agree or agree that they need to keep taking mathematics for the kind of job they want	EQAO Grade 9 Student Questionnaire
Student Attitudes—think mathematics is an easy subject	Percentage of students who reported that they strongly agree or agree that mathematics is an easy subject	EQAO Grade 9 Student Questionnaire

Notes

1., 2. *The Ontario Curriculum* sets the provincial standard at Level 3.

3., 20. Data pertaining to gender and student status are provided by schools on the SIF. Data pertaining to school background and language are gathered from the Student Questionnaire.

4., 5., 6., 7., 8., 9., 13., 15., 21., 22., 23., 24., 25., 26., 30., 32. See explanation of terms.

10., 11., 12., 14., 16., 27., 28., 29., 31., 33. Percentages may not add up to 100, due to rounding.

17., 34. Data for the following tables derive from the Grade 9 Student Questionnaire.

18., 35. Data for the following tables derive from the Grade 9 Teacher Questionnaires.

19., 36. Teachers responded on a Likert scale from "not at all accessible"(1) to "very accessible" (5). This summarizes responses at 4 and 5.