

Grade 9 Assessment of Mathematics, 2000–2001

Release Items



Education
Quality and
Accountability
Office

Introduction

In the 2000–2001 school year, the Education Quality and Accountability Office (EQAO) administered the first Grade 9 Assessment of Mathematics to all Grade 9 students enrolled in academic or applied mathematics programs in publicly funded English- or French-language schools.

Background

The Education Quality and Accountability Office

EQAO is an independent, arm’s-length agency established by the Government of Ontario. Its purpose is to promote greater accountability and better quality in Ontario’s publicly funded school system. EQAO is governed by a volunteer board of directors and led by a Chief Executive Officer.

The role of EQAO is to

- design and implement a comprehensive program of student assessment within government-established guidelines;
- advise the Minister of Education on assessment policy;
- develop and implement a system for measuring the quality of education in Ontario;
- lead Ontario’s participation in national and international assessments;
- promote research in best practices in assessment and accountability;
- conduct quality reviews in cooperation with school boards; and
- report to the Minister of Education, the public and the education community on system quality issues and make recommendations for improvement.

Development of the Grade 9 Assessment of Mathematics

EQAO’s commitment to both accountability and improvement has led to the development of specific criteria for the Grade 9 Assessment of Mathematics. The objectives of the assessment are to

- obtain valid and reliable information about student achievement;
- ask students to work independently to complete challenging tasks across the mathematics curriculum;
- provide a broad view of students’ knowledge and skills in mathematics; and
- contribute to student learning.

In recognition of the similarities and differences between applied and academic mathematics curricula in both English and French, EQAO developed separate assessments for students in each program. Approximately 40% of the items were common to both the applied and the academic assessments. The assessments were administered at the end of the first semester for semester-one classes and at the end of the second semester for semester-two and full-year classes. The first- and second-semester/full-year versions were comparable.

The Grade 9 Assessment of Mathematics was developed by EQAO in collaboration with teams of Ontario teachers, consultants, principals and university mathematics faculty members. These educators contributed their expertise in mathematics, their knowledge of the expectations for Grade 9 as outlined in *The Ontario Curriculum, Grades 9 and 10: Mathematics*, their experience with equity issues, their understanding of the special needs of some students and their technical knowledge of reliability and validity.

Assessment items were developed by practising classroom teachers from across Ontario. Items were then piloted in a sample of volunteer classes. In May 2000, a number of different forms of the assessment were field tested in a sample of applied and academic classes across the province. Field test items were marked in July 2000. Additional items were field tested and piloted during the January 2001 administration; these additional items were not included in student scores. Students and teachers provided feedback about the assessment items at each stage of the development. This information assisted EQAO in revising and finalizing the materials for the 2000–2001 administrations.

Components of the Grade 9 Assessment of Mathematics, 2000–2001

Multiple-Choice

Students solved 24 questions during a 30-minute period.

Each multiple-choice question was related to a single strand and a single category. The questions provided students with an opportunity to demonstrate their understanding without having to show their work. The questions assessed components of the curriculum that could be measured easily and effectively through multiple-choice questions.

Short Answer

Students solved 12 items during a 30-minute period.

Each short answer item was related to a single strand and a single category. The items required students to think mathematically but demanded minimal written response.

Tasks

Students solved a total of six tasks: three tasks during 40 minutes in each of two mathematics classes.

Each task was a collection of related questions based on one or two strands from the curriculum. The tasks were coded for information about achievement across all four categories and the strands related to the question.

Additional Component

Students completed an additional 30-minute component. Multiple versions of these additional booklets were distributed across the province. They included items that are used to establish comparability of assessments as well as items being piloted or field tested for future assessments or support materials.

Accommodations and Exemption

EQAO has developed an accommodations and exemption policy. Information on the policy was included in the *Guide for Principals and Teachers Administering the Grade 9 Assessment of Mathematics*.

Timetable for the Administration of the Grade 9 Assessment of Mathematics

The assessment was administered between January 11 and 23, 2001 for students in semester one and between May 28 and June 14, 2001 for students in full-year or semester-two programs.

There were two options for administering the assessment. The decision between a three- and five-day schedule was made on a whole-school/department basis. A separate decision could be made for applied and academic classes.

Three Days of Assessment

Day One

Multiple-Choice Questions	30 min
Tasks 1–3	40 min

Day Two

Short Answer Items	30 min
Tasks 4–6	40 min

Day Three

Additional Component: Multiple-Choice, Short Answer or Tasks	30 min
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Five-Day Plan

Day One

Multiple-Choice Questions	30 min
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Day Two

Tasks 1–3	40 min
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Day Three

Short Answer Items	30 min
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Day Four

Tasks 4–6	40 min
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Day Five

Additional Component: Multiple-Choice, Short Answer or Tasks	30 min
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Scoring the Grade 9 Assessment of Mathematics

In July 2001, teachers from across the province scored the Grade 9 assessment. The assessment was scored analytically using descriptive codes specific to each item or part(s) of a task and to the category being assessed. This method of scoring recognized that student achievement is a continuum.

Each student's performance across all three components (multiple-choice, short answer and tasks) was aggregated through the application of Item Response Theory (IRT). The IRT analysis provided a weighting for each item's characteristics. These weights were applied to the student's results to obtain IRT-scaled scores. This IRT scale was aligned with the levels of achievement as determined by

- **Item Location:** Educators aligned the codes for each item of the tasks and each short answer item to the levels of the Achievement Chart
- **Student Location:** Educators holistically evaluated samples of student work on the tasks
- **Confirmation:** Educators reviewed samples of student work in relation to the levels of achievement and the IRT continuum.

Overall student achievement and achievement for the strands and categories are reported at four levels of performance that align to the Ministry Achievement Chart.

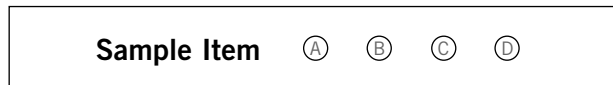
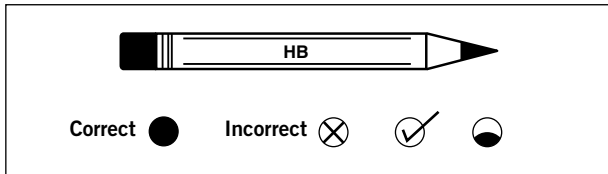


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Student Answer Sheet — BOOKLET 1

Make heavy black marks that fill the circle completely.
Cleanly erase any answer you wish to change.



1. (A) (B) (C) (D)

2. (F) (G) (H) (J)

3. (A) (B) (C) (D)

4. (F) (G) (H) (J)

5. (A) (B) (C) (D)

6. (F) (G) (H) (J)

7. (A) (B) (C) (D)

8. (F) (G) (H) (J)

9. (A) (B) (C) (D)

10. (F) (G) (H) (J)

11. (A) (B) (C) (D)

12. (F) (G) (H) (J)