Introduction

The Education Quality and Accountability Office (EQAO) administers the 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 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 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 among the 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 versions in each language. The assessments are 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 are 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 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 expertise with respect to reliability and validity.

Assessment items are developed by practising classroom teachers from across Ontario. Items are pilot and field tested in a sample of applied and academic classes across the province. Pilot- and field-test items are not included in student scores. Students and teachers provide feedback about the assessment items at each stage of development. This information assists EQAO in revising and finalizing the materials for the assessment.

Components of the Grade 9 Assessment of Mathematics

Multiple-Choice

Students solved 24 questions during a 30-minute period.

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

Short Answer

Students solve 10 items during a 30-minute period.

Each short answer item is related to a single strand and a single category. The items require students to think mathematically but demand minimal written response.

Tasks

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

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

Additional Component

Students in a sample of school boards complete an additional 30-minute component. Multiple versions of these additional booklets are distributed across the province. They include items that are used to establish the comparability of assessments as well as items being pilot or field tested for future assessments or support materials.

Accommodations and Exemptions

EQAO has developed an accommodation and exemption policy. Information on the policy is included on the *Steps and Teacher's Scripts* CD and on the EQAO Web site, www.eqao.com.

Timetable for the Administration of the Grade 9 Assessment of Mathematics

The assessment was administered in January for students in semester one and in late May and June 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

Five-Day Plan

Day One	
Multiple-Choice Questions	30 min
Day Two	
Tasks 1–3	40 min
Day Three	
Short Answer Items	30 min
Day Four	
Tasks 4–6	40 min
Day Five	
Additional Component: Multiple-Choice, Short Answer or Tasks	30 min

Scoring the Grade 9 Assessment of Mathematics

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

Each student's performance across all three components (multiple-choice, short answer and tasks) is 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 each student's results to obtain IRT-scaled scores. This IRT scale is aligned with the levels of achievement as determined by

- Item Location: Educators align the codes for each item of the tasks and each short answer item to the levels of the Ministry's achievement chart for mathematics;
- Student Location: Educators holistically evaluate samples of student work on the tasks and
- Confirmation: Educators review 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 according to four levels of performance that align to the achievement chart for mathematics.