

Alberta Provincial
Achievement Testing

Assessment
Highlights
2009

GRADE

9

Mathematics

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This document contains assessment highlights from the 2009 Grade 9 English Mathematics Achievement Test.

Assessment highlights provide information about the overall test, the test blueprints, and student performance on the English form of the 2009 Grade 9 Mathematics Achievement Test. Also provided is commentary on student performance at the *acceptable standard* and the *standard of excellence* on the 2009 achievement test. This information is intended for teachers and is best used in conjunction with the multi-year and detailed school reports that are available to schools via the extranet. **Assessment Highlights** reports for all achievement test subjects and grades will be **posted on the Alberta Education website every year** in the fall.

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The Alberta Education Internet address is education.alberta.ca.

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The 2009 Grade 9 Mathematics Achievement Test

This report provides teachers, school administrators, and the public with an overview of the performance of those students who wrote the English form of the 2009 Grade 9 Mathematics Achievement Test. It complements the detailed school and jurisdiction reports.

How Many Students Wrote the Test?

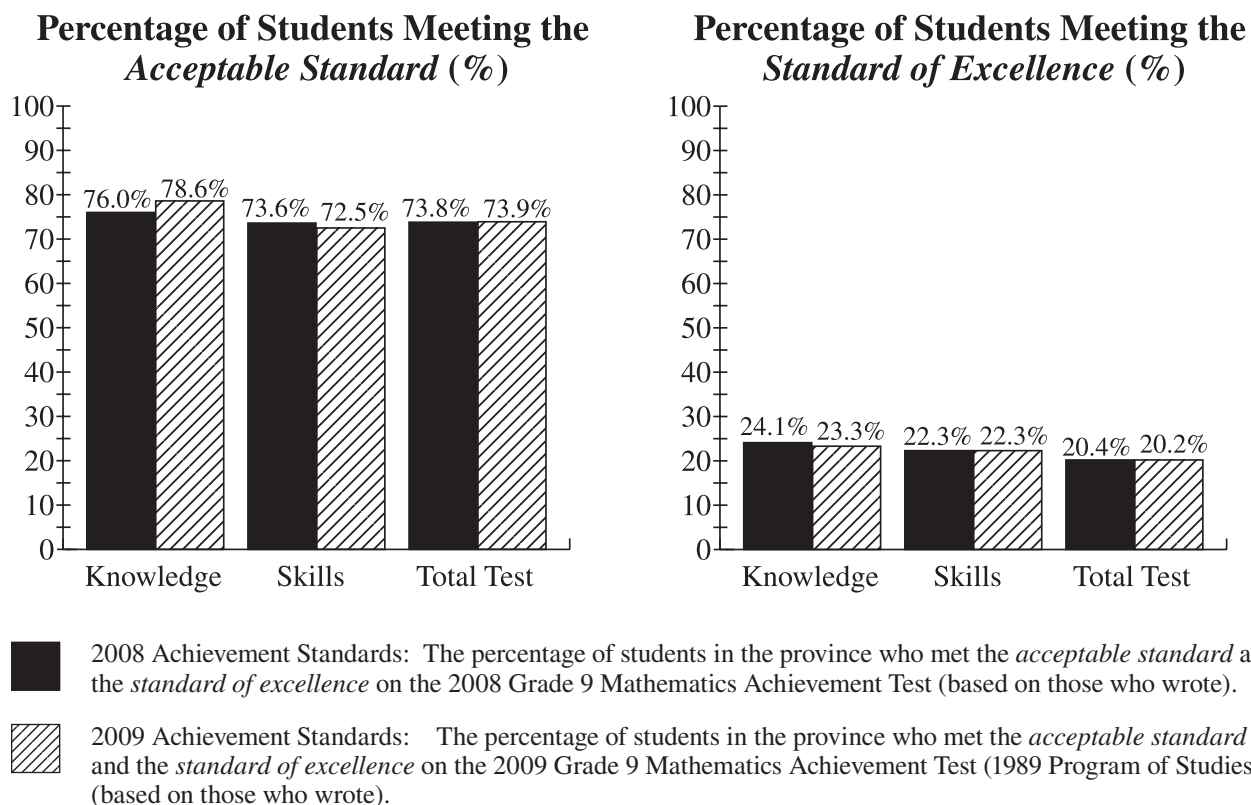
A total of 36 290 students wrote the English form of the 2009 Grade 9 Mathematics Achievement Test.

What Was the Test Like?

The 2009 Grade 9 Mathematics Achievement Test consisted of 44 multiple-choice and 6 numeric-response items based on four strands: Number; Patterns and Relations; Shape and Space; and Statistics and Probability.

How Well Did Students Do?

The percentages of students meeting the *acceptable standard* and the *standard of excellence* in 2009 are consistent with 2008, as shown in the graphs below. Out of a total possible score of 50, the provincial average on the English form of the test was 30.7 (61.4%). The results presented in this report are based on scores achieved by all students who wrote the English form of the test; results for those students in French Immersion and Francophone programs who wrote the French form of the test are reported separately. Detailed provincial assessment results are provided in school and jurisdiction reports.



2009 Test Blueprint and Student Achievement

In 2009, 73.9% of students who wrote the English form of the test achieved the *acceptable standard* on the Grade 9 Mathematics Achievement Test, and 20.2% of students achieved the *standard of excellence*. Compared with the results from 2008, the percentage of students achieving the *acceptable standard* increased slightly by 0.1%, and the percentage of students achieving the *standard of excellence* decreased slightly by 0.2%.

The blueprint below shows the reporting categories and test sections (curricular content areas) by which 2009 summary data are reported to schools and school authorities, and the provincial average of student achievement by both raw score and percentage.

Test Sections	Reporting Category		Provincial Student Achievement Average Raw Score and Percentage
	Knowledge	Skills	
	Recall facts, concepts, procedures, and terminology	Apply facts, concepts, procedures, terminology, and relationships to solve problems in a variety of situations	
Number <ul style="list-style-type: none"> • Number Concepts • Number Operations 			8.0/13 (61.5%)
Patterns and Relations <ul style="list-style-type: none"> • Patterns • Variables and Equations • Relations and Functions 			9.1/15 (60.7%)
Shape and Space <ul style="list-style-type: none"> • Measurement • 3-D Objects and 2-D Shapes • Transformations 			8.6/14 (61.4%)
Statistics and Probability <ul style="list-style-type: none"> • Data Analysis • Chance and Uncertainty 			5.0/8 (62.5%)
Provincial Student Achievement Average Raw Score and Percentage for Students Who Wrote the Test	10.5/16 (65.6%)	20.2/34 (59.4%)	Total Test Raw Score 30.7/50 (61.4%)

*Please Note: Twenty items have not been released from the 2008 test.

2009 Mathematics 9 PAT Student Performance Commentary

The following table provides a brief synopsis of student performance demonstrated on the 2009 Grade 9 Mathematics Achievement Test. The observations have been categorized in terms of student performance strengths and challenges in relation to outcomes that were tested in each of the four strands from the Alberta Program of Studies for K–9 Mathematics.

Strand	Outcome Strengths	Outcome Challenges
Number	<ul style="list-style-type: none"> • Determining the value of powers with integral exponents, using the exponent laws • Solving multi-step problems using rational numbers in meaningful contexts • Using a calculator to perform calculations involving scientific notation and exponent laws 	<ul style="list-style-type: none"> • Determining whether or not a number is rational • Applying the exponent laws for powers with integral exponents • Applying the exponent laws to simplify expressions with variable bases and evaluating expressions with numerical bases • Applying proper calculator keying sequences to perform calculations involving rational numbers
Patterns and Relations	<ul style="list-style-type: none"> • Solving first-degree, single-variable equations • Simplifying polynomial expressions represented by diagrams • Determining the product of two monomials, a monomial and a polynomial, and two binomials 	<ul style="list-style-type: none"> • Modeling situations that can be represented by first-degree expressions • Solving, algebraically, first-degree inequalities with one variable and determining the correct representation of the solution on a number line • Determining the quotient when a polynomial is divided by a monomial
Shape and Space	<ul style="list-style-type: none"> • Recognizing why two triangles are similar and using the properties of similar triangles to solve problems • Relating congruence to similarity in the context of triangles • Matching a 3-D object with its plan and elevation views • Determining the image of a 2-D shape as a result of a single transformation 	<ul style="list-style-type: none"> • Relating expressions for volumes of cones to volumes of cylinders • Applying the rate of area to perimeter to solve design problems in two dimensions • Recognizing why two triangles are congruent and using the properties of congruent triangles to solve problems
Statistics and Probability	<ul style="list-style-type: none"> • Interpreting scatterplots to determine an apparent relationship • Determining the data collection method that would be most representative of a given population • Recognizing the use of statistical information by the media to influence conclusions made by consumers 	<ul style="list-style-type: none"> • Solving problems involving the probability of independent events • Recognizing the use of scatterplots to represent discrete and continuous variables

Achievement Testing Program Support Documents

The Alberta Education website contains several documents that provide valuable information about various aspects of the achievement testing program. To access these documents, go to the Alberta Education website at education.alberta.ca. From the home page, follow this path: *Teachers > Provincial Testing > Achievement Tests*, and then click on one of the specific links under the *Achievement Tests* heading to access the following documents.

Achievement Testing Program General Information Bulletin

The *General Information Bulletin* is a compilation of several documents produced by Alberta Education and is intended to provide superintendents, principals, and teachers with easy access to information about all aspects of the achievement testing program. Sections in the bulletin contain information pertaining to schedules and significant dates; security and test rules; test administration and directives; test accommodations; field testing; resources and web documents; calculator and computer policies; test marking and results; samples, forms, and letters; and Learner Assessment contacts.

Subject Bulletins

At the beginning of each school year, subject bulletins are posted on the Alberta Education website for all achievement test subjects for grades 3, 6, and 9. Each bulletin provides descriptions of assessment standards, test design and blueprinting, and scoring guides as well as suggestions for preparing students to write the tests and information about how teachers can participate in test development activities.

Writing Samples

For achievement tests in grades 3, 6, and 9 English Language Arts and Français/French Language Arts, and grades 6 and 9 Mathematics, writing samples have been designed to be used by teachers and students to enhance students' writing and to assess this writing relative to the standards inherent in the scoring guides for the achievement tests. The writing samples documents contain sample responses with scoring rationales that relate student work to the scoring categories and scoring criteria for the writing assignments.

Previous Achievement Tests and Answer Keys

All January achievement tests (parts A and B) for Grade 9 semestered students are secured and must be returned to Alberta Education. All May/June achievement tests are secured except Part A of grades 3, 6, and 9 English Language Arts and Français/French Language Arts. Unused or extra copies of only these Part A tests may be kept at the school after administration. Teachers may also use the print versions of released items that have been mailed to schools and/or the tests that are posted on the Alberta Education website.

Parent Guides

Each school year, print versions of the *Parent Guide to Provincial Achievement Testing* for grades 3, 6, and 9 are mailed to schools and posted on the Alberta Education website. Each guide presents answers to frequently asked questions about the achievement testing program; descriptions of and sample questions for each achievement test subject; and excerpts from the *Curriculum Handbook for Parents* identifying what students should know and be able to do in each subject by the end of grades 3, 6, and 9.

Involvement of Teachers

Teachers of grades 3, 6, and 9 are encouraged to take part in a variety of activities related to the achievement testing program. These activities include item development, test validation, field testing, and marking. In addition, regional consortia can make arrangements for teacher in-service workshops on topics such as Interpreting Achievement Test Results to Improve Student Learning.