



Grade 9 Assessment Highlights Science

Alberta Provincial Achievement Testing **2021–2022**

This document was written primarily for:

Students	
Teachers	✓ Grade 9 Science
Administrators	✓
Parents	
General Audience	
Others	

Alberta Education, Government of Alberta

2022–2023

Grade 9 Science Assessment Highlights

Distribution: This document is posted on the [Alberta Education website](#).

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You can find [provincial achievement test-related materials](#) on the Alberta Education website.

Additional topics of interest are found in the [General Information Bulletin](#).

This document contains assessment highlights from the *2022 Grade 9 Science Provincial Achievement Test*.

Assessment Highlights provides information about the overall test, the test blueprint, and student performance on the provincial achievement test that was administered in 2022. Also provided is information on student performance at the acceptable standard and the standard of excellence on selected items from the *2022 Grade 9 Science Provincial Achievement Test*. This information is intended for teachers and is best used in conjunction with multi-year and detailed school reports that are available to schools via the Stakeholder File Exchange (SFX). *Assessment Highlights* for all provincial achievement test subjects and grades are posted on the Alberta Education website every year in the fall.

The examination statistics that are included in this document represent both French and English writers. If you would like to obtain English-only statistics or French-only statistics that apply to your school, please refer to your detailed reports, which are available on the Stakeholder File Exchange (SFX).

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The 2022 Grade 9 Science Provincial Achievement Test

This report provides teachers, school administrators, and the public with an overview of the performance of those students who wrote the 2022 Grade 9 Science Provincial Achievement Test. It complements the detailed school and jurisdiction reports.

How many students wrote the test?

A total of 21 964 students in Alberta had results reported provincially for the 2022 Grade 9 Science Provincial Achievement Test. Security breaches occurred over last few days of the 2021-22 PAT administration window. To maintain the validity and comparability of provincial results, students most likely impacted by these security breaches have been excluded from the provincial cohort.

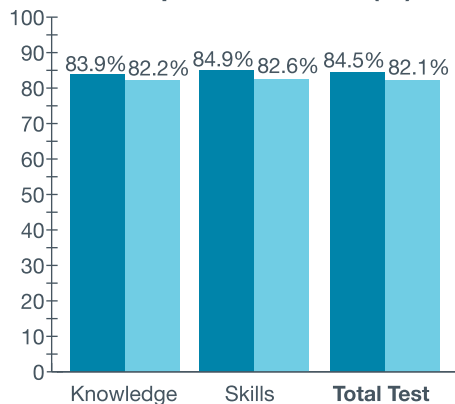
What was the test like?

The 2022 Grade 9 Science Provincial Achievement Test consisted of 47 multiple-choice items and 5 numerical-response items based on five science topics: Biological Diversity; Matter and Chemical Change; Environmental Chemistry; Electrical Principles and Technologies; and Space Exploration.

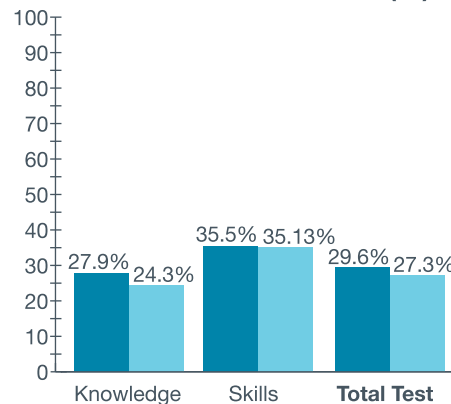
How well did students do?

The percentages of students meeting the acceptable standard and the standard of excellence in 2022 compared with 2019 are shown in the graphs below. Out of a total possible score of 52, the provincial average was 34.6 (66.5%). The examination statistics that are included in this document represent both French and English writers. If you would like to obtain English-only or French-only statistics that apply to your school, please refer to the detailed reports that are available on the Stakeholder File Exchange (SFX).

Percentage of Students Meeting the Acceptable Standard (%)



Percentage of Students Meeting the Standard of Excellence (%)



 2019 Achievement Standards: The percentage of students in the province that met the acceptable standard and the standard of excellence on the 2021 Grade 9 Science Provincial Achievement Test (based on those who wrote)

 2022 Achievement Standards: The percentage of students in the province that met the acceptable standard and the standard of excellence on the 2022 Grade 9 Science Provincial Achievement Test (based on those who wrote)

2022 Test Blueprint and Student Achievement

In 2022, 84.5% of students who wrote the *Grade 9 Science Provincial Achievement Test* achieved the acceptable standard, and 29.6% of students who wrote achieved the standard of excellence. These results are consistent with previous administrations of the provincial achievement test.

Student achievement on the *2022 Grade 9 Science Provincial Achievement Test* averaged 34.6 out of a total score of 52 (66.5%).

The blueprint below shows the reporting categories and topics by which 2022 summary data are reported to schools and school authorities and lists the provincial average of student achievement by both raw score and percentage.

Topics	Reporting Category		Provincial Student Achievement Average (Raw Score and Percentage)
	Knowledge	Skills	
	Fundamental understanding of both the concepts and the processes of science	Application of science processes and the use of higher-level thinking to solve problems	
Biological Diversity			6.7/10 (67.0%)
Matter and Chemical Change			7.1/11 (64.5%)
Environmental Chemistry			6.6/10 (66.0%)
Electrical Principles and Technologies			7.0/11 (63.6%)
Space Exploration			7.2/10 (72.0%)
Provincial Student Achievement Average (Raw Score and Percentage)	14.5/22 (65.9%)	20.1/30 (67.0%)	Total Test 34.6/52 (66.5%)

Commentary on 2022 Student Achievement

The following is a brief summary of the areas where most students demonstrated strengths and experienced difficulties on the *2022 Grade 9 Science Provincial Achievement Test*.

Students demonstrated relative strength by being able to

- identify the statement that describes a symbiotic relationship of mutualism
- match a whmis 2015 pictogram with its meaning and its safe-handling procedure
- identify the question under investigation from a procedure
- classify canadian contributions to space based on their purpose

Students demonstrated relative difficulty when asked to

- distinguish between mitosis and meiosis and identify the number of chromosomes in the sex cells produced
- identify a chemical reaction from a word equation
- identify examples of biodegradation
- analyze circuit diagrams to determine which will function for the intended purpose

Provincial Achievement Testing Program Support Documents

The Alberta Education website contains several documents that provide valuable information about various aspects of the provincial achievement testing program. To access these documents, go to the [Alberta Education website](#). Click on one of the specific links to access the following documents.

Provincial 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 Provincial Achievement Test Program. Sections in the bulletin contain information pertaining to schedules and significant dates; security and test rules; test administration directives, guidelines, and procedures; calculator and computer policies; test accommodations; test marking and results; field testing; resources and web documents; forms and samples; and Provincial Assessment Sector contacts.

Subject bulletins

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

Examples of the standards for students' writing

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

Previous provincial achievement tests and answer keys

All January provincial achievement tests (parts A and B) for Grade 9 semestered students are secured and must be returned to Alberta Education. All May/June provincial achievement tests are secured except *Part A* of grades 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 released items and/or tests that are posted on the Alberta Education website.

Parent guides

Each school year, versions of the Alberta Provincial Achievement Testing [Parent Guide](#) for grades 6 and 9 are posted on the Alberta Education website. Each guide answers frequently asked questions about the Provincial Achievement Test Program and provides descriptions of and sample questions for each provincial achievement test subject.

Involvement of teachers

Teachers of grades 6 and 9 are encouraged to take part in activities related to the Provincial Achievement Test Program. These activities include item development, test validation, field testing, and marking. In addition, arrangements can be made through the Alberta Regional Professional Development Consortia for teacher in-service workshops on topics such as interpreting provincial achievement test results to improve student learning.