

**Alberta Provincial
Achievement Testing**

**Assessment
Highlights
2015–2016**

**GRADE
9**

Knowledge and Employability Science

Alberta  Government

This document was written primarily for:

| | |
|------------------|-----------------|
| Students | |
| Teachers | ✓ of KE Science |
| Administrators | ✓ |
| Parents | |
| General Audience | |
| Others | |

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The [Alberta Education website](http://education.alberta.ca) is found at education.alberta.ca.

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The 2016 Grade 9 Knowledge and Employability Science Achievement Test

This report provides teachers, school administrators, and the public with an overview of the performance of those students who wrote the 2016 Grade 9 Knowledge and Employability Science Achievement Test. The examination statistics that are included in this document represent all writers, both French and English. 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 Extranet. This report complements the detailed school and jurisdiction reports.

How Many Students Wrote the Test?

A total of 1 336 students wrote the 2016 Grade 9 Knowledge and Employability Science Achievement Test.

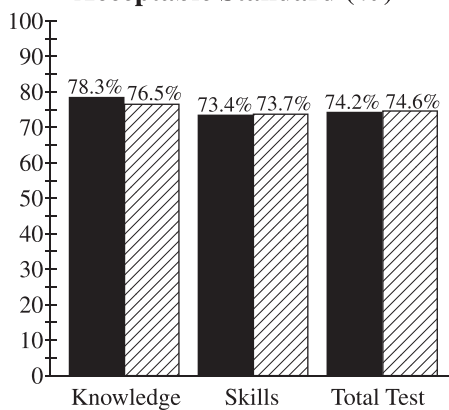
What Was the Test Like?

The 2016 Grade 9 Knowledge and Employability Science Achievement Test consisted of 50 multiple-choice questions based on five science topics: Biological Diversity, Matter and Chemical Change, Environmental Chemistry, Electrical Principles and Technologies, and Space Exploration.

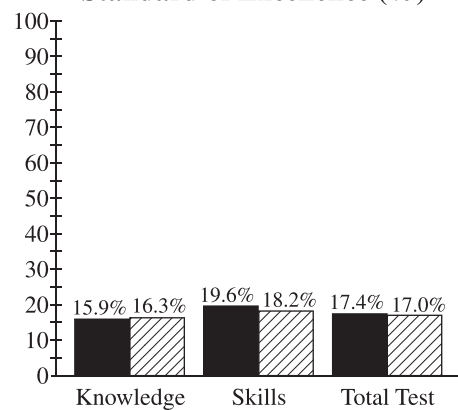
How Well Did Students Do?


The percentages of students meeting the acceptable standard and the standard of excellence in 2016 compared with 2015 are shown in the graphs below. Out of a possible total score of 50, the provincial average was 31.5 (63.0%).


Percentage of Students Meeting the Acceptable Standard (%)



Percentage of Students Meeting the Standard of Excellence (%)



 2015 Achievement Standards: The percentage of students in the province who met the acceptable standard and the standard of excellence on the 2015 Grade 9 Knowledge and Employability Science Achievement Test (based on those who wrote).

 2016 Achievement Standards: The percentage of students in the province who met the acceptable standard and the standard of excellence on the 2016 Grade 9 Knowledge and Employability Science Achievement Test (based on those who wrote).

2016 Test Blueprint and Student Achievement

In 2016, 74.6% of students who wrote the Grade 9 Knowledge and Employability Science Achievement Test achieved the acceptable standard, and 17.0% of students who wrote achieved the standard of excellence.

The blueprint below shows the reporting categories and topics by which 2016 summary data are reported to schools and school authorities, and it shows 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 | |
| Biological Diversity | | | 6.9/10 (69.0%) |
| Matter and Chemical Change | | | 6.2/10 (62.0%) |
| Environmental Chemistry | | | 6.4/10 (64.0%) |
| Electrical Principles and Technologies | | | 5.8/10 (58.0%) |
| Space Exploration | | | 6.3/10 (63.0%) |
| Provincial Student Achievement (Average Raw Score and Percentage) | 13.4/21 (63.8%) | 18.1/29 (62.4%) | Total Test Raw Score = 31.5/50 (63.0%) |

Commentary on 2016 Student Achievement

The following is a brief summary of the areas where most students experienced difficulties and demonstrated strengths on the 2016 Grade 9 Knowledge and Employability Science Achievement Test. Four sample questions are also provided to highlight some of these areas. These questions are no longer secured and will not be reused on future achievement tests.

Students demonstrated relative strength by being able to:

- identify an example of a human trait that is heritable;
- analyze information to identify a diagram that accurately reflected the given data;
- apply the particle model of matter to identify a specific state of matter;
- use information from a nutritional label in order to identify specific quantities of nutrients;
- identify and distinguish events related to static and current electricity.

For **multiple-choice question 1**, students had to recognize and identify an example of a human trait that is heritable. Approximately 80.9% of students who met the acceptable standard and 92.5% of students who met the standard of excellence answered this question correctly.

1. Which of the following human traits is heritable?
 - A. Reading ability
 - B. Hair length
 - C. Eye colour
 - D. Strength

9.8% of the students chose A

7.0% of the students chose B

76.1% of the students chose C (correct answer)

6.8% of the students chose D

For **multiple-choice question 27**, students had to use information from a nutritional label in order to identify specific quantities of nutrients. Approximately 76.4% of students who met the acceptable standard and 93.4% of students who met the standard of excellence answered this question correctly.

Use the following information to answer question 27.

| SuperCrunch Cereal | | |
|--|--------------|-------------------------|
| Nutrition Facts | | |
| Serving size 3/4 cup dry (40 g) | | |
| Servings per box 10 | | |
| Amount per serving | Cereal Alone | With 1/2 cup Whole Milk |
| Calories | 140 | 220 |
| % Daily value* | | |
| Total Fat 3 g | 5 % | 12 % |
| Cholesterol 0 mg | 0 % | 0 % |
| Sodium 0 mg | 0 % | 3 % |
| Total Carbohydrate 54 g | 18 % | 21 % |
| Dietary fibre | 15 % | 15 % |
| Sugars 1 g | | |
| Protein 1 g | 2 % | 2 % |
| Vitamin A | 0 % | 4 % |
| Vitamin C | 10 % | 10 % |
| Calcium | 0 % | 15 % |
| Iron | 10 % | 10 % |

* Percent daily values based on a 2 000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

- 27.** According to the information above, which nutrient has its percent daily value increased the most when a $\frac{1}{2}$ cup of whole milk is added?
- A.** Vitamin A
 - B.** Vitamin C
 - C.** Calcium
 - D.** Iron

7.4% of the students chose A
 12.7% of the students chose B
 71.2% of the students chose C (correct answer)
 8.4% of the students chose D

Students experienced relative difficulty with:

- analyzing information in order to identify an inference that was supported by the given information sources;
- analyzing information to draw a conclusion related to the motion of given planets;
- analyzing given actions to assess which action would likely result in a solution to a given issue;
- analyzing information in a circuit diagram to make a prediction related to the function of a given circuit;
- using and applying given information from a periodic table in order to identify elements according to properties.

For **multiple-choice question 25**, students had to analyze given actions to assess which action would likely result in a solution to a given issue. Approximately 59.5% of students who met the acceptable standard and 70.2% of students who met the standard of excellence answered this question correctly.

Use the following information to answer question 25.

During the past year, algae has begun to grow rapidly in a local pond and the fish are dying. In order to fix this problem, concerned community members need to know why the algae has begun to grow.

- 25.** Which of the following actions would **most likely** be the first step in solving the problem?
- A.** Perform water analysis tests on water from the pond
 - B.** Investigate local farming practices occurring near the pond
 - C.** Kill the algae by adding chemicals to the pond
 - D.** Restrict public access to the pond

56.4% of the students chose A (correct answer)

20.4% of the students chose B

7.6% of the students chose C

15.3% of the students chose D

For **multiple-choice question 44**, students had to analyze information to draw a conclusion related to the motion of given planets. Approximately 45.7% of students who met the acceptable standard and 68.9% of students who met the standard of excellence answered this question correctly.

Use the following information to answer question 44.

| Some Characteristics of the Planets in Our Solar System | | | | | | |
|--|--------------|--------------|-------------|----------------|---------------|---------------|
| | Venus | Earth | Mars | Jupiter | Saturn | Uranus |
| Mean distance from the Sun (AU) | 0.72 | 1.00 | 1.52 | 5.20 | 9.54 | 19.19 |
| Length of year (Earth time) | 224.7 days | 365.26 days | 686.98 days | 11.86 years | 29.45 years | 84.02 years |
| Diameter (km) | 12 104 | 12 742 | 6 794 | 139 822 | 116 463 | 50 724 |
| Composition | solid | solid | solid | gas | gas | gas |
| Known natural satellites | 0 | 1 | 2 | 67 | 62 | 27 |
| Length of day (Earth time) | 243.02 days | 23.93 hours | 1.03 days | 9.92 hours | 10.66 hours | 17.24 hours |

- 44.** According to the information in the chart above, which of the following planets will take the longest time to revolve around the Sun?
- A.** Venus
 - B.** Earth
 - C.** Jupiter
 - D.** Saturn

31.4% of the students chose A
 9.7% of the students chose B
 13.6% of the students chose C
 44.9% of the students chose D (correct answer)

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](#). Click on one of the specific links 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 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 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 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 for the achievement tests. The exemplars documents contain sample responses with scoring rationales that relate student work to the scoring categories and scoring criteria.

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 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 achievement testing program and provides descriptions of and sample questions for each achievement test subject.

Involvement of Teachers

Teachers of grades 6 and 9 are encouraged to take part in activities related to the achievement testing 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 achievement test results to improve student learning.