

**Alberta Provincial  
Achievement Testing**

**Assessment  
Highlights  
2015–2016**

**GRADE  
6**

# Science



*Alberta*  Government

This document contains assessment highlights from the 2016 Grade 6 Science Achievement Test.

This *Assessment Highlights* document provides information about the overall test, the test blueprint, and student performance on the 2016 Grade 6 Science Achievement Test. Also provided is commentary on areas of strength and weakness in student performance at the acceptable standard and the standard of excellence on selected items from the 2016 achievement tests. 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 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 Extranet.

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The [Alberta Education](http://www.education.alberta.ca) Internet address is education.alberta.ca.

This document was written primarily for:

|                  |                      |
|------------------|----------------------|
| Students         |                      |
| Teachers         | ✓ of Grade 6 Science |
| Administrators   | ✓                    |
| Parents          |                      |
| General Audience |                      |
| Others           |                      |

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## The 2016 Grade 6 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 6 Science Achievement Test. It complements the detailed school and jurisdiction reports.

### How Many Students Wrote the Test?

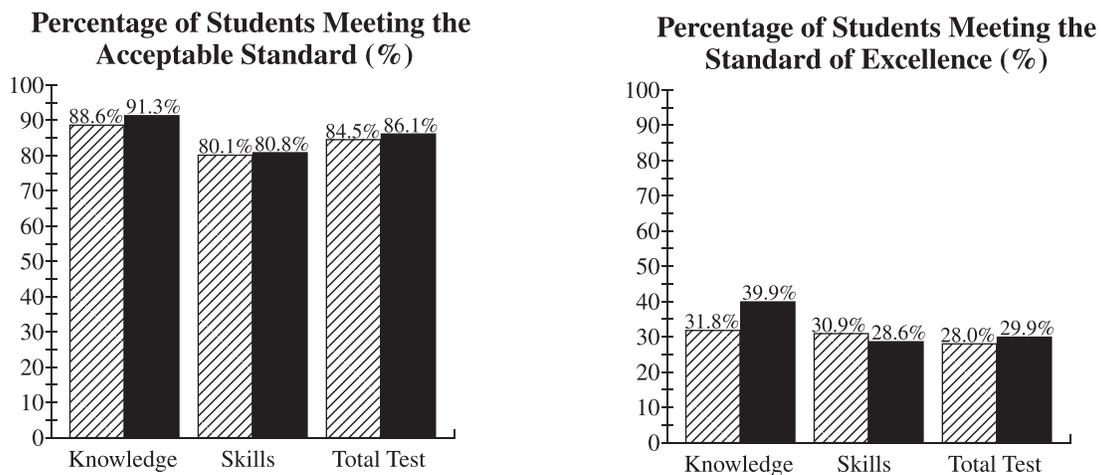
A total of 43 090 students wrote the 2016 Grade 6 Science Achievement Test.

### What Was the Test Like?

The 2016 Grade 6 Science Achievement Test consisted of 50 multiple-choice items based on five science topics: Inquiry and Problem Solving; Air, Aerodynamics, and Flight; Sky Science; Evidence and Investigation; and Trees and Forests.

### 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 total possible score of 50, the provincial average was 34.5 (69.0%). 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 Extranet.



 2015 Achievement Standards: The percentage of students in the province who met the acceptable standard and the standard of excellence on the 2015 Grade 6 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 6 Science Achievement Test (based on those who wrote).

## ***2016 Test Blueprint and Student Achievement***

In 2016, 86.1% of students who wrote the Grade 6 Science Achievement Test achieved the acceptable standard, and 29.9% of students who wrote achieved the standard of excellence. These results are consistent with previous administrations of the achievement test.

Student achievement on the 2016 Grade 6 Science Achievement Test averaged 34.5 out of a total score of 50 (69.0%).

The blueprint below shows the categories and topics by which 2016 summary data are reported to schools and school authorities and lists the provincial average of student achievement by both raw score and percentage.

| <b>Topics</b>  | <b>Reporting Category</b>   |   | <b>Provincial Student Achievement Average (Raw Score and Percentage)</b> |
|--|---|---|--|
|  | <b>Knowledge</b>  | <b>Skills</b>   |  |
|  | 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 |  |
| <b>Inquiry and Problem Solving</b>   |   |   | <b>7.5/11<br/>(68.2%)</b>  |
| <b>Air, Aerodynamics, and Flight</b>   |   |   | <b>9.7/14<br/>(69.3%)</b>  |
| <b>Sky Science</b>   |   |   | <b>5.6/8<br/>(70.0%)</b>   |
| <b>Evidence and Investigation</b>  |   |   | <b>4.8/7<br/>(68.6%)</b>   |
| <b>Trees and Forests</b>   |   |   | <b>7.0/10<br/>(70.0%)</b>  |
| <b>Provincial Student Achievement Average Raw Score and Percentage for Students Who Wrote the Test</b> | <b>14.8/21<br/>(70.5%)</b>  | <b>19.7/29<br/>(67.9%)</b>  | <b>Total Test<br/>34.5/50<br/>(69.0%)</b>                                |

## Commentary on 2016 Student Achievement

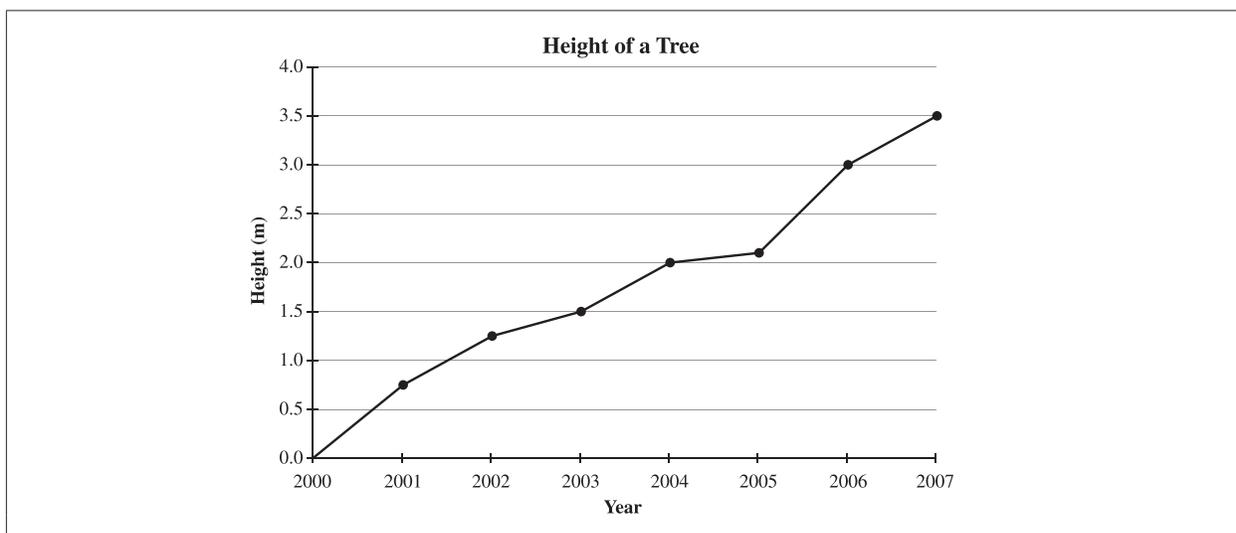
The following is a brief summary of the areas where most students demonstrated strengths and experienced difficulties on the 2016 Grade 6 Science Achievement Test. Four sample items are also provided to highlight some of these areas. These items are no longer secured and will not be reused on future achievement tests.

### Students demonstrated relative strength by being able to:

- identify certain parts of an airplane
- explain how air confined in a space reacts to an outside force
- describe the position of Earth in relation to the Sun in different seasons
- analyze information presented about planets and identify a conclusion that can be made from the information

For **multiple-choice question 38**, a Skills item, students had to analyze a graph and determine a characteristic of a tree. Approximately 84.7% of students who met the acceptable standard and 96.1% of students who met the standard of excellence answered this item correctly.

*Use the following information to answer question 38.*



38. Based on the graph above, between which years was the tree's growth **most** affected by good growing conditions?
- A. 2001 and 2002
  - B. 2003 and 2004
  - C. 2004 and 2005
  - D. 2005 and 2006

5.1 % of the students chose A

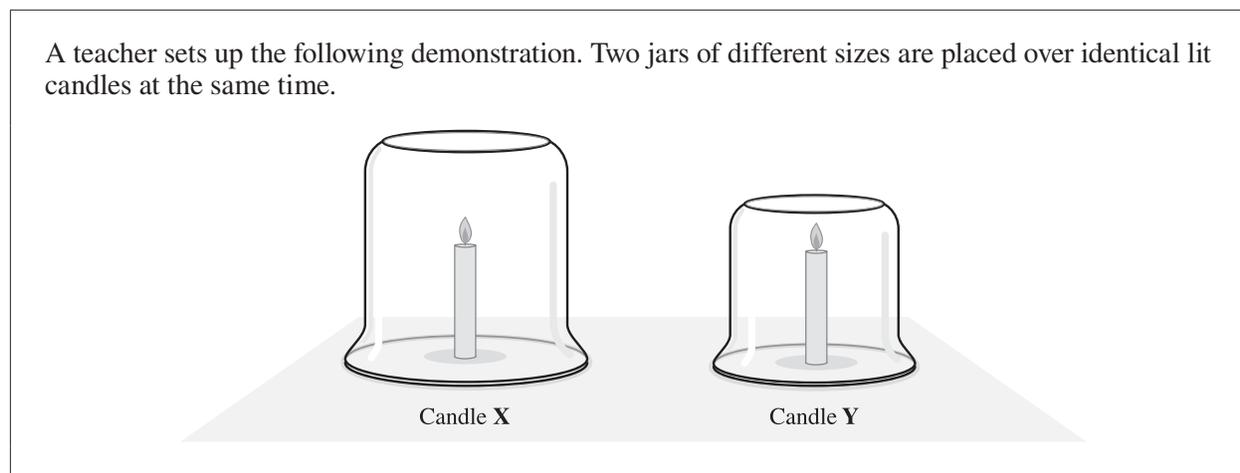
4.0 % of the students chose B

7.4 % of the students chose C

83.4 % of the students chose D (correct answer)

For **multiple-choice question 16**, a Knowledge item, students had to compare two burning candles and predict which will burn longer and explain why it will burn longer. Approximately 76.5% of students who met the acceptable standard and 94.4% of students who met the standard of excellence answered this item correctly.

Use the following information to answer question 16.



16. Candle   *i*   will **most likely** burn longer because there is   *ii*   in the jar.

The statement above is completed by the information in row

| Row | <i>i</i> | <i>ii</i>           |
|-----|----------|---------------------|
| A.  | X        | more oxygen         |
| B.  | X        | more carbon dioxide |
| C.  | Y        | less oxygen         |
| D.  | Y        | less carbon dioxide |

77.6% of the students chose A (correct answer)

9.9% of the students chose B

9.1% of the students chose C

3.4% of the students chose D

**Students demonstrated relative difficulty when asked to:**

- identify the explanation for the experimental results by applying knowledge of Bernoulli's principle
- determine the sequence of events based on evidence at a scene
- identify an event that would cause the most damage to the sustained life of a forest
- differentiate between relevant information and irrelevant information when linking evidence to a possible source

For **multiple-choice question 28**, a Skills item, students had to evaluate evidence and make inferences based on a data table. Approximately 65.0% of students who met the acceptable standard and 88.7% of students who met the standard of excellence answered this item correctly.

*Use the following information to answer question 28.*

A soil sample taken from a bike tire is compared with soil samples from four sites. The soil sample from the bike tire has the following properties: it is red, acidic, and granular, and it has particles that are 0.8–1.0 mm in size.

**Soil Samples Taken from Different Sites**

| Site | Colour | Acidity | Texture  | Particle Size |
|------|--------|---------|----------|---------------|
| 1    | Red    | Acidic  | Granular | 0.2–0.8 mm    |
| 2    | Red    | Acidic  | Granular | 0.8–1.2 mm    |
| 3    | Red    | Basic   | Granular | 0.8–1.0 mm    |
| 4    | Red    | Acidic  | Fine     | 0.8–1.0 mm    |

**28.** The bike was **most likely** at

- A.** Site 1
- B.** Site 2
- C.** Site 3
- D.** Site 4

4.0% of the students chose A

67.7% of the students chose B (correct answer)

18.3% of the students chose C

9.9% of the students chose D

For **multiple-choice question 32**, a Skills item, students had to evaluate an experiment to determine a responding variable. Approximately 44.4% of students who met the acceptable standard and 80.2% of students who met the standard of excellence answered this item correctly.

*Use the following information to answer question 32.*

### **Fabric Analysis Experiment**

#### **Procedure**

- Step 1** Place a sample of a fabric in 500 mL of hot water.
- Step 2** Place a second sample of the same fabric in 500 mL of cold water.
- Step 3** Add 10 mL of laundry soap to each sample.
- Step 4** Stir the two mixtures for 10 minutes.
- Step 5** Let the two mixtures sit for 20 minutes.
- Step 6** Remove the fabric samples from the beakers.
- Step 7** Note any visible changes in the colour of the remaining water.
- Step 8** Record your observations.

**32.** The responding variable in the experiment described above is the

- A.** amount of dye present in the water
- B.** volume of soap added to the water
- C.** time the samples are left to sit
- D.** volume of water used

52.0% of the students chose A (correct answer)

14.0% of the students chose B

19.5% of the students chose C

14.3% of the students chose D

## ***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.