

Alberta Provincial
Achievement Testing

Subject
Bulletin
2011–2012

GRADE
6

Science

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éduquer

Government
of Alberta ■

Alberta ■

Freedom To Create. Spirit To Achieve.

This document was written primarily for:

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

Distribution: This document is posted on the Alberta Education website at education.alberta.ca.

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You can find achievement test-related materials on the Alberta Education website at education.alberta.ca, then follow the pathway: Administrators > Provincial Testing > [Achievement Tests](#).

Throughout this subject bulletin, references to specific sections of the *General Information Bulletin* are italicized. These references will provide further information.

Grade 6 Science Assessment

General Description

The Grade 6 Science Achievement Test consists of 50 multiple-choice questions. The test is developed to be completed in 60 minutes; however, students may have an additional 30 minutes if necessary.

Students require HB pencils, erasers, and scrap paper. Calculators are not required for successful completion of the assessment but are permitted.

Students record their answers on a tear-out answer sheet.

Knowledge and skill components are integrated in the assessment. Knowledge components relate to fundamental understanding of both the concepts and the processes of science. Skill components relate to the application of science processes and the use of higher-level thinking to solve problems.

The questions are placed in real-life contexts. Frequently, a number of questions will be clustered around a common context.

Questions will have contexts drawn from the following topics:

- Inquiry and Problem Solving
- Air, Aerodynamics, and Flight
- Sky Science
- Evidence and Investigation
- Trees and Forests

If a word that warrants definition is used on a test, it will be defined on the page on which it appears.

Blueprint

The blueprint below shows the reporting categories under which questions are classified. The number of questions in each reporting category is approximate.

General Learner Expectations	Question Distribution by Reporting Category		Number (Percentage) of Questions
	Knowledge	Skills	
Inquiry and Problem Solving <ul style="list-style-type: none"> • Work cooperatively with others to design and carry out an investigation in which variables are identified and controlled. • Recognize the importance of accuracy in observation and measurement, and apply suitable methods to record, compile, interpret, and evaluate observations and measurements gathered by self and group. • Work cooperatively with others to design and carry out an investigation of a practical problem and to develop a possible solution. 		11	11 (22%)
Air, Aerodynamics, and Flight <ul style="list-style-type: none"> • Describe properties of air and the interactions of air with objects in flight, construct devices that move through air, and identify adaptations for controlling flight. 	9	5	14 (28%)
Sky Science <ul style="list-style-type: none"> • Observe, describe, and interpret the movement of objects in the sky, and identify pattern and order in these movements. 	4	4	8 (16%)
Evidence and Investigation <ul style="list-style-type: none"> • Apply observation and inference skills to recognize and interpret patterns, and to distinguish a specific pattern from among a group of similar patterns. • Apply a knowledge of the properties and interactions of materials to the investigation and identification of a material sample. 	2	5	7 (14%)
Trees and Forests <ul style="list-style-type: none"> • Describe characteristics of trees and the interaction of trees with other living things in the local environment. 	5	5	10 (20%)
Number (Percentage) of Questions	20 (40%)	30 (60%)	50 (100%)

Description of Science Assessment Standards

The following statements describe what is expected of Grade 6 students at the *acceptable standard* and the *standard of excellence* based on outcomes in the *Program of Studies*. These statements represent examples of the standards against which student achievement is measured. It is important to remember that one test cannot measure all of the outcomes in the *Program of Studies*.

<i>Acceptable Standard</i>	<i>Standard of Excellence</i>
<p>Students who meet the <i>acceptable standard</i> in Grade 6 Science are able to</p> <ul style="list-style-type: none"> • design and carry out an investigation in which variables are identified and controlled, and which provide a fair test of the question being investigated • recognize the importance of accuracy in observation and measurement, and apply suitable methods to record, compile, interpret, and evaluate observations and measurements. They can also design and carry out an investigation of a practical problem involving the construction or modification of a device that moves through air, and they can develop a possible solution • describe the properties of air and the interactions of air with objects in flight • construct devices that move through air and identify adaptations for controlling flight • describe and interpret the movement of objects in the sky, and identify pattern and order in these movements • identify materials and apply knowledge of the properties and interactions of those materials to an investigation • describe the characteristics of trees and the interaction of trees with other living things in the local environment 	<p>Students who meet the <i>standard of excellence</i> in Grade 6 Science are able to</p> <ul style="list-style-type: none"> • design, carry out, and evaluate an investigation in which variables are identified and controlled • identify new questions to be explored • make observations and measurements accurately • apply novel methods to record, compile, interpret, and evaluate observations and measurements • design, carry out, and evaluate an investigation of a practical problem involving the construction or modification of a device that moves through air, and develop a workable solution • describe in detail the properties of air and the interactions of air with objects in flight • construct aerodynamic devices that move through air, and identify and make adaptations for controlling flight • make detailed descriptions and accurate interpretations about the movements of objects in the sky, and identify their specific patterns • apply knowledge of the properties and the interaction of materials to both the investigation and identification of a material sample with precision • clearly describe the characteristics of trees and the interaction of trees with other living things in the local environment • demonstrate confidence in their personal ability to learn and develop problem-solving skills, perseverance in the search for understanding, and critical thinking in examining evidence and determining what the evidence means

Preparing Students for the Science Test

Suggestions for Preparing Students

The best way to prepare students for writing the achievement test is to teach the curriculum well and to ensure that students know what is expected. Many of the skills and attitudes that support test writing are, in fact, good skills and strategies for approaching all kinds of learning tasks.

Note that the questions on the science test are placed in real-life contexts.

Teachers are encouraged to familiarize their students with the types of questions that will appear on the test. Every second year, beginning in the Fall of 2007, a released Science Achievement Test will be posted to education.alberta.ca.

Teachers are also encouraged to share the following information with their students to help them prepare for the Grade 6 Science Achievement Test.

Suggestions for Answering Questions

- Before you begin, find out how much time you have.
- Ask questions if you are unsure of anything.
- Skim through the whole test before beginning. Find out how many questions there are and plan your time accordingly.
- Answer the easier questions first; then go back to the more difficult ones.
- Do not spend too much time on any one question. Make a mark (* or ?) beside any questions you have difficulty with and go back to them if you have time.
- Read each question carefully, underline or highlight key words, and try to determine an answer before looking at the choices.
- Read all the choices and see which one best fits the answer.
- When you are not sure which answer is correct, cross out any choices that are wrong and then select the best of the remaining choices.
- If time permits, recheck your answers.
- Double-check to make sure that you have answered everything before handing in the test.
- Read the information given using the strategy that works best for you. You should either
 - look at all the information and think carefully about it before you try to answer the question
 - or**
 - read the questions first and then look at the information, keeping in mind the questions you need to answer
- Make sure that you look at all forms of the information given. Information may be given in words, charts, pictures, graphs, or maps.
- When information is given for more than one question, go back to the information before answering each question.
- Check your work when you calculate an answer, even when your answer is one of the choices.
- When answering “best answer” questions, be sure to carefully read all four alternatives (A, B, C, and D) before choosing the answer that you think is best. These questions will always include a bold-faced qualifier such as **best**, **most strongly**, or **most clearly** in their stems. All the alternatives (A, B, C, and D) are, to some degree, correct, but one of the alternatives will be “best” in that it takes more of the information into account or can be supported most strongly by reference to the information.

Opportunities to Participate in Test Development Activities

Field Testing

All Achievement Testing Program test questions are field tested before use. By “testing” the test questions, students who write field tests have an opportunity for a practice run at writing portions of an achievement test. As well, the teachers have an opportunity to comment on the appropriateness and quality of the test questions.

[Request forms](#) for Grade 6 Science and Sciences 6^e année field tests that will be administered in May and June can be found on the Alberta Education website by following this link: education.alberta.ca/admin/testing/forms.aspx. Principals and teachers who wish to participate in the field-testing program must complete and return request forms to the Field-Test Coordinator at field.test@gov.ab.ca.

Once the completed request forms are received by the Assessment Sector, classes will be selected to ensure a representative and sufficiently large sample of students from across the province take part in the field test. Every effort will be made to place field tests as requested; however, because field tests are administered to a prescribed number of students, it may not be possible to fill all requests. Once the field tests are placed, a confirmation letter of test placements will be sent to each principal in early April, with memos to the teachers who will be participating in the field testing.

New: Starting in 2012, all Science 6 field tests will include numerical-response (NR) questions. This format, currently used in Science 9 and Math 6 and 9, allows the testing of outcomes that are difficult to assess using multiple-choice (MC) questions. Please see examples of NR questions in the Appendix.

For further information about achievement field testing, see the *Field Testing* and *Samples/Forms/Letters* sections of the [General Information Bulletin](#).

Working Groups

Teacher involvement in the development of provincial achievement tests is important because it helps to ensure the validity and appropriateness of the assessments.

To be selected to participate in a working group, a teacher must be nominated by a school administrator or superintendent, and that nomination must be approved by the superintendent. To ensure that selected working-group members have appropriate subject matter training and teaching experience, nominees are asked to provide their information to their school administrator so that it can be forwarded to the Assessment Sector at Alberta Education through the superintendent.

Test Development

Teacher working groups are used throughout the test development process to create raw forms of test questions, and to review and revise draft forms of provincial achievement tests. These working groups usually meet for one or two days, two or three times per year. Occasionally, these meetings are held on weekends or in the summer.

To be eligible to serve on a test development working group, a teacher must currently be teaching Grade 6 Science and must have a minimum of two years' experience teaching the course.

Teachers participating in test development and/or test review working groups are selected from the working-group nominees provided by superintendents of school jurisdictions.

Appendix: Sample Numerical-Response Questions

Use the following information to answer numerical-response question 1.

Listed below are three vegetables.

- 1 Carrot
- 2 Potato
- 3 Broccoli

Numerical Response

1. When the vegetables listed above are placed in alphabetical order, the order is _____, _____, and _____.

(Record all **three digits** of your answer in the response boxes at the bottom of the screen.)

Use the following information to answer numerical-response question 2.

The following illustrations are of animals that live in Alberta.



1



2



3



4

Numerical Response

2. Match each animal, as numbered above, with its name, as given below.

Rabbit

Sheep

Wolf

Bear

(Record all **four digits** of your answer in the response boxes at the bottom of the screen.)

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