Grade 6 Subject Bulletin Science

Alberta Provincial Achievement Testing 2023-2024



This document was written primarily for			
✓	Grade 6 Science		
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	√	✓ Grade 6 Science	

2023-2024 Science 6 Subject Bulletin

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You can find <u>provincial achievement test-related materials</u> on the Alberta Education website.



Grade 6 Science Provincial Achievement Test

General description

The Grade 6 Science Provincial Achievement Test consists of 50 multiple-choice questions.

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

Knowledge and skill components are integrated in the test. 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.

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

The test is developed to be completed in 60 minutes; however, students have up to 120 minutes to complete the test should they need it.

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

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

Students may not use a dictionary, a thesaurus, or other reference materials when writing the test. If a word that warrants a definition is used on a test, it will be defined on the page on which it appears.

Description of Grade 6 Science provincial 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 <u>Grade 6 Science Program of Studies</u>. These statements represent examples of the standards against which student achievement is measured. It is important to remember that one test cannot measure all the outcomes in the Grade 6 Science Program of Studies.

Acceptable Standard

Students who meet the acceptable standard in Grade 6 Science are able to

- 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

Standard of Excellence

Students who meet the standard of excellence in Grade 6 Science are able to

- 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

Blueprint

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

	QUESTION DISTRIBUTION BY REPORTING CATEGORY		
General Learner Expectations	Knowledge	Skills	Number (Percentage) of Questions
Inquiry and Problem Solving		11	11 (22%)
 Design and carry out an investigation in which variables are identified and controlled and that provides 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. 			
 Design and carry out an investigation of a practical problem, and develop a possible solution. 			
Air, Aerodynamics, and Flight	9	5	14 (28%)
 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. 			
Sky Science	4	4	8 (16%)
 Observe, describe, and interpret the movement of objects in the sky, and identify pattern and order in these movements. 			
Evidence and Investigation	2	5	7 (14%)
 Apply observation and inference skills to recognize and interpret patterns, and 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. 			
Trees and Forests	5	5	10 (20%)
 Describe characteristics of trees and the interaction of trees with other living things in the local environment. 			
Number (Percentage) of Questions	20 (40%)	30 (60%)	50 (100%)

Preparing Students for the Provincial Achievement Test

Suggestions for preparing students

The best way to prepare students for writing the provincial 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. Released Materials from previously secured tests are available on the Alberta Education website under the Subject area resources heading.

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

Special-format practice tests

To give students an opportunity to practise provincial achievement test-style questions and content in Braille, audio, large print, or coloured print versions, Alberta Education produces special-format practice tests for all subjects that have a provincial achievement test. Alberta schools with registered Alberta K–12 students may place orders for these tests. Braille versions are available in English and, by request, in French. All tests are provided free of charge, but limits may be placed on order volumes to ensure access for all students.

For the greatest benefit, special-format practice tests should be written under conditions similar to those of the corresponding provincial achievement test. The same rules regarding the use of resources and devices should be followed.

Braille versions must be returned to Alberta Education after use.

For more information or to place an order, contact

Distribution Coordinator, Examination Administration 780-641-9116 or Field.Test@gov.ab.ca

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 alternatives.
- Read all the alternatives and see which one best fits the answer.
- When you are not sure which answer is correct, cross out any alternatives that are wrong and then select the best of the remaining alternatives.
- 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 alternatives.
- 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 boldfaced 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 provincial achievement 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 answering questions that could be used on future provincial achievement tests. As well, the teachers have an opportunity to comment on the appropriateness and quality of the test questions.

Through the online field-test request system, teachers can create and modify field-test requests and check the status of these requests. Information regarding the field-test process and the request system is available at Provincial Achievement Tests.

Once the completed requests are received by the Provincial Assessment Sector, classes will be selected to ensure that 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.

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.

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.

To be eligible to serve on a test-development working group, a teacher must currently be teaching the course in question or must have taught the course within the past three years.

Teachers participating in working groups are selected from the working-group nominees approved by superintendents of school jurisdictions. The call for nominations usually occurs in September. However, we will accept further nominations throughout the year. In some subjects, more teachers may be nominated for working groups than are needed. When teachers are selected, there must be a balance of first-time and experienced working-group members and regional representation by zone, school authority, and school. Unfortunately, not everyone whose name is submitted will be selected.

Appendix 1: Example of Grade 6 Science 2022 PAT Instructions Pages

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Duplication of this test in any manner or its use for purposes other than those authorized and scheduled by Alberta Education is strictly prohibited.

Grade 6 Provincial Achievement Test

Science

To the Teacher:

Read these instructions to your students.

Description

• There are 50 multiple-choice questions on this test.

Time: 60 minutes. You have up to 120 minutes to complete this test should you need it.

Instructions

- Turn to the last page of the test booklet. Carefully fold and tear out the machinescored answer sheet along the perforation.
- You may use a calculator, but it is not necessary.
- You may not use a dictionary, a thesaurus, or other reference materials.
- Read each question carefully and choose the **correct** or **best** answer.
- Make sure that the number of the question on your answer sheet matches the number of the question that you are answering.
- Use **only** an **HB** pencil to mark your answer.
- If you change an answer, **erase** your first mark **completely**.
- Try to answer every question.
- When you have completed the test, please answer the **survey question**, which appears after the last test question.
- Now read the detailed instructions for answering multiple-choice questions.

You may write in this booklet if you find it helpful. Make sure that your answers are placed on the answer sheet.

2022

Multiple Choice

- Each question has four possible answers from which you are to choose the **correct** or **best** answer.
- Locate the question number on the separate answer sheet provided and fill in the circle that corresponds to your choice.

Examples

This test is for the subject of

- A. science
- **B.** mathematics
- **C.** language arts
- **D.** social studies

Answer Sheet



Which of the following rows identifies the subject and grade level of this test?

Row	Subject	Grade
A.	Science	6
В.	Science	9
C.	Mathematics	6
D.	Mathematics	9

Answer Sheet



When there are no clouds, during the day the sky appears \underline{i} and at night the sky appears \underline{ii} .

The statement above is completed by the information in row

Row	i	ii
A.	blue	blue
В.	blue	black
C.	white	blue
D.	white	black

Answer Sheet



GRADE 6 SCIENCE

Appendix 2: Example of Grade 6 Science Answer Sheet

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Time Taken: ABODEF

A B C D A B C D B © D ABCD A B C AB© A B C (B) (C) 49 44 47 20 31 32 33 34 35 36 38 39 37 A B C D ABCD ABCD A B C D (1) \triangleleft \triangleleft \triangleleft \triangleleft 23 2 24 25 27 28 29 Ξ 4 17 18 (B) (C) (D) ABCD A B C D ABCD ABCD A B C D ABCD A B C D A B C D

Fold and tear along perforation.

Appendix 3: Examples of Descriptions for Audio Versions of the Grade 6 Science Provincial Achievement Test

This appendix has been prepared by Provincial Assessment, Alberta Education. The purpose of this appendix is to provide school staff with examples of the descriptions of diagrams, illustrations, and visuals used in provincial achievement test audio versions, which are available to students as an accommodation. These examples are neither exhaustive nor prescriptive. Test content is shown in black text and descriptions in blue text.

For students who are enrolled with a school, and who typically use audio for their coursework, no application is required to receive this accommodation when writing provincial achievement tests. Such students may have visual impairments, physical disabilities, or learning disabilities. The audio version is used by students in conjunction with a print, digital, or Braille version of the test.

Additional information on how to prepare for science exams can be found on the Alberta Education website under Support documents, Science – General, *Examples of Descriptions Used in Audio Versions of Science Diploma Exams*, at Writing diploma exams.

Units

Unit	Read as
S	seconds
min	minutes
m	metres
m^2	square metres
L	litres
m/s	metres per second
km/h	kilometres per hour
m/s^2	metres per second squared
g	grams
°C	degrees Celsius

Note: This table includes SI units and non-SI units. Names of SI base units and SI-derived units are from National Institute of Standards and Technology, 2020.

Unit prefixes

Unit Prefix	Read as
k	kilo
m	milli
c	centi

Symbols

Symbols	Read as
+	plus
_	minus
±	plus or minus
*	divided by
×	times
<	is less than
>	is greater than
=	is equal to
\$	dollars
%	percent

Numerical values

Numerical Value	Read as
183.48	one hundred eighty-three decimal four eight
2 321	two thousand three hundred twenty-one
$\frac{3}{5}$	three over five
-5	negative five
+5	positive five

Note: Common fractions, such as $\frac{1}{2}$, may be read as "one over two" or "one half."

Tables

Introduce the table starting with the title, and then identify the number of columns and rows. Tables can be read in different ways. One way is to list the column headings and any corresponding units first. Next, read across each row from left to right, stating the column heading before reading the data in each cell. Read empty spaces in tables as "blank."

Comparison of Two Planets

	Earth	Mars
Distance from the Sun	150 000 000 km	225 000 000 km
Time required for radio waves to travel from the Sun	8.3 min	?

There is a table titled "Comparison of Two Planets," with two columns and two rows. The column headings are "Earth" and "Mars." The row headings are "Distance from the Sun" and "Time required for radio waves to travel from the Sun." The information in the table is as follows:

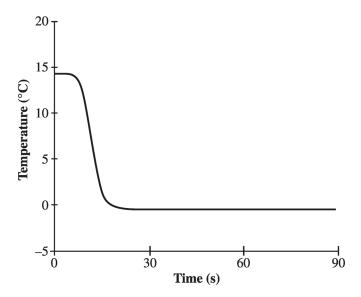
Distance from the Sun: Earth – one hundred fifty million kilometres; Mars – two hundred twenty-five million kilometres.

Time required for radio waves to travel from the Sun: Earth – eight decimal three minutes; Mars – question mark.

Graphs

Introduce the graph starting with the title, if there is one, and then describe the labels and scales for the horizontal axis and the vertical axis. If there are no marks or scale on the axis, state so. To describe the shape of the line representing the data, reference the axis and use descriptive words such as *top*, *bottom*, *right*, *left*, *downward*, *upward*, *rises*, and *falls*. When there are four graphs for each of the multiple-choice options (A, B, C, and D), describe the labels and scales for the similarities between the graphs, such as the horizontal axis and the vertical axis, and then describe the shape of the line for each of the choices.

Temperature of Water Placed Outside

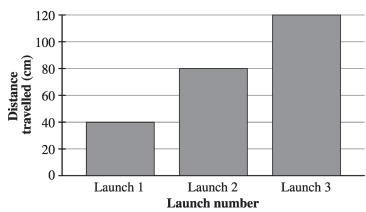


There is a line graph titled "Temperature of Water Placed Outside." The horizontal axis is labelled "Time" in seconds, scaled from zero to ninety, marked and labelled in increments of thirty. The vertical axis is labelled "Temperature" in degrees Celsius, scaled from negative five to twenty, and marked and labelled in increments of five. The line begins on the vertical axis at approximately fourteen degrees Celsius. It then falls at approximately ten seconds to become almost vertical. It then becomes horizontal, once again, at approximately twenty seconds and zero degrees Celsius and remains horizontal until it reaches the right side of the graph.

Bar graphs

Introduce the graph starting with the title, then describe the label for the horizontal axis, list the label for each bar, and then describe the label and scale for the vertical axis. Describe the height to which each labelled bar rises.

Distance Travelled by the Model Airplane



There is a bar graph titled "Distance Travelled by the Model Airplane." The horizontal axis is labelled "Launch number" and from left to right the bars are labelled "Launch 1," "Launch 2," and "Launch 3." The vertical axis is labelled "Distance travelled" in centimetres, scaled from zero to one hundred twenty, marked and labelled in increments of twenty.

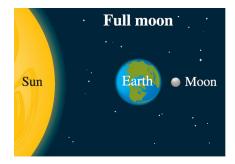
The bars on the graph read as follows.

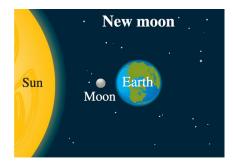
Launch one – forty

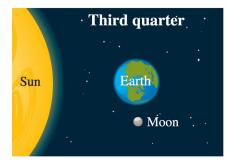
Launch two – eighty

Launch three – one hundred twenty

Phases of the Moon diagrams









There are four diagrams, each with a large section of a circle labelled "Sun," a medium-sized circle labelled "Earth," showing the northern hemisphere, and a small circle labelled "Moon." In all four diagrams, the Sun and Earth are aligned horizontally, with the Sun at the left of the diagram and Earth near the centre of the diagram. The Moon is in a different position in each diagram.

The top-left diagram, titled "Full moon," shows the Moon to the right of Earth, aligned horizontally with the Sun and Earth.

The top-right diagram, titled "New moon," shows the Moon between the Sun and Earth, aligned horizontally with the Sun and Earth.

The bottom-left diagram, titled "Third quarter," shows the Moon near the bottom of the diagram, aligned vertically with Earth.

The bottom-right diagram, titled "First quarter," shows the Moon near the top of the diagram, aligned vertically with Earth.

Contacts 2023-2024

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