

GOVERNMENT OF ALBERTA

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# Education

## Annual Report Update

### 2022-2023

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## Results Analysis

### Discussion and Analysis of Results

This annual report update provides analysis of Alberta students' results on Language Arts and Mathematics Provincial Achievement Tests administered in the 2022-23 school year.

Results for 2019-20 and 2020-21 Provincial Achievement Tests are not available in this report due to the impact of COVID-19-related learning disruptions. Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. To maintain the validity of provincial results, student data most likely impacted by these security breaches has been excluded from the overall results.

Provincial Achievement Test results from 2022-23 do not include students who participated in the optionally implemented/piloted curriculum and were excused from writing in those subject areas. As a result, Provincial Achievement Test results for 2022-23 (at overall and individual subject levels) were not assessed against historical results. Caution should be exercised when interpreting the results over time.

The targets for 2022-23 were set based on 2018-19 data. These targets were published as part of the performance measures in the 2022-25 Education Business Plan. Caution should be exercised when assessing results relative to targets.

### Outcome Three

#### **Alberta has excellent teachers, school leaders and school authority leaders**

Alberta Education maintains high standards of professional practice and conduct in the teaching profession by ensuring that the preparation and professional growth of teachers, school leaders and school authority leaders focus on the tools needed to help students achieve their best. The department also helps foster effective learning and teaching through a collaborative leadership approach. School authority leaders attend to local and societal context, implement strategic direction and policies and manage resources to enable learning supports, quality teaching and leading and student achievement. Teachers and leaders are responsible for applying the appropriate knowledge and abilities to make decisions resulting in quality teaching, leading and learning for all students.

## **Overall Achievement Test Results in Language Arts and Mathematics**

### ***Rationale***

- Overall student achievement of standards on provincial achievement tests is a sound indicator of whether elementary and junior high students are achieving high standards in Language Arts and in Mathematics, an important outcome for Alberta's K-12 education system.

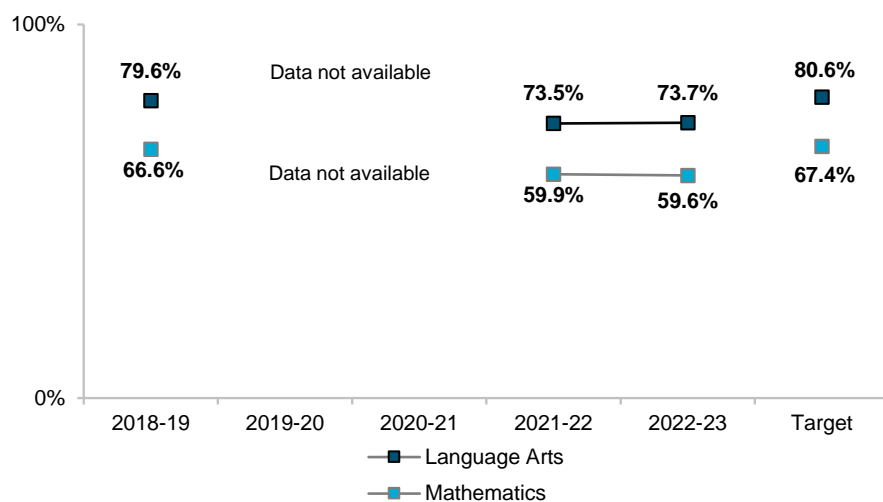
### ***Targets***

- The targets for the overall Language Arts and Mathematics results at the acceptable standards were not met.

### ***Discussion***

- In the 2022-23 school year, 73.7 per cent of students achieved the acceptable standard in Language Arts overall, while 59.6 per cent of students achieved the acceptable standard in Mathematics overall.
- Results for the 2019-20 and 2020-21 school years are not available as participation in the Provincial Achievement Tests was impacted by COVID-19-related learning disruptions. Caution should be exercised when interpreting the results over time.
- Overall results in Language Arts are calculated as an average of the results in the following seven subjects weighted by the number of individuals that were enrolled:
  - English Language Arts 6 and 9
  - French Language Arts 6 and 9
  - Français 6 and 9
  - English Language Arts 9 (Knowledge and Employability)
- Overall results in Mathematics are calculated as an average of the results in the following three subjects weighted by the number of individuals that were enrolled:
  - Mathematics 6
  - Mathematics 9
  - Mathematics 9 (Knowledge and Employability)
- Due to the impact of COVID-19-related learning disruptions in 2019-20, 2020-21 and 2021-22, the wildfires in 2018-19 and 2022-23, and the June 2022 Grade 9 Provincial Achievement Test security breaches, 2022-23 Provincial Achievement Test results (at overall and individual subject levels) were not assessed over time. Caution should be exercised when interpreting the results over time.
- The 2022-23 Provincial Achievement Test results do not include students who participated in the optionally implemented/piloted curriculum and were excused from writing in those subject areas.
- To support student learning in core subjects, the ministry provides programs of study and implementation guides for teachers and develops or authorizes learning resources for students in all grades and subjects.

## Overall Percentages of Students Who Achieved Standards on Grades 6 and 9 Provincial Achievement Tests in Language Arts and Mathematics



**Source:** Alberta Education

### Notes:

- Results for 2019-20 and 2020-21 school years are not available as participation in the Provincial Achievement Tests was impacted by COVID-19-related learning disruptions. Caution should be exercised when interpreting the results over time.
- Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. Student data most likely impacted by these security breaches has been excluded from the overall results. Caution should be exercised when interpreting the results over time.
- The 2022-23 Provincial Achievement Test results do not include students who participated in the optionally implemented/ piloted curriculum and were excused from writing in those subject areas.
- The percentages of students who achieved the acceptable standard include the students who achieved the standard of excellence.
- Overall Language Arts results are a weighted average based on total enrolment in Grades 6 and 9 Language Arts courses.
- Overall Mathematics results are a weighted average based on total enrolment in Grades 6 and 9 Mathematics courses.
- See Endnote A, page 9, for information on assessing results relative to targets and results over time.
- See Endnote B, Provincial Achievement Tests, pages 11-12.

### Discussion:

- The overall participation rate for students taking Language Arts and Mathematics Provincial Achievement Tests has decreased compared to 2018-19. Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. Caution should be exercised when interpreting the results over time.

### Participation Rates for Language Arts and Mathematics Provincial Achievement Tests (in percentages)

| Subject  | 2018-19 | 2019-20            | 2020-21 | 2021-22 | 2022-23 |
|--|---------|--------------------|---------|---------|---------|
| Language Arts  |         |                    |         |         |         |
| Grade 6  |         |                    |         |         |         |
| English Language Arts                                  | 91      | Data not available |         | 85      | 84      |
| French Language Arts                                   | 98      |                    |         | 95      | 93      |
| Français   | 97      |                    |         | 94      | 88      |
| Grade 9  |         |                    |         |         |         |
| English Language Arts                                  | 88      | Data not available |         | 82      | 84      |
| English Language Arts<br>(Knowledge and Employability) | 80      |                    |         | 75      | 70      |
| French Language Arts                                   | 97      |                    |         | 93      | 94      |
| Français   | 97      |                    |         | 93      | 94      |
| Overall Language Arts                                  |         |                    |         |         |         |
|  | 90.0    | Data not available |         | 84.2    | 84.5    |
| Mathematics  |         |                    |         |         |         |
| Grade 6  |         |                    |         |         |         |
| Mathematics  | 91      | Data not available |         | 86      | 85      |
| Grade 9  |         |                    |         |         |         |
| Mathematics  | 89      | Data not available |         | 83      | 84      |
| Mathematics<br>(Knowledge & Employability)             | 87      |                    |         | 82      | 82      |
| Overall Mathematics                                    |         |                    |         |         |         |
|  | 89.9    | Data not available |         | 84.6    | 84.3    |

Source: Alberta Education

#### Notes:

- Results for 2019-20 and 2020-21 school years are not available as participation in the Provincial Achievement Tests was impacted by COVID-19-related learning disruptions. Caution should be exercised when interpreting the results over time.
- The 2022-23 Provincial Achievement Test results do not include students who participated in the optionally implemented/ piloted curriculum and were excused from writing in those subject areas.
- The percentages of students who achieved the acceptable standard include the students who achieved the standard of excellence.
- Knowledge and Employability courses are designed for students who meet enrolment criteria and learn best through experiences that integrate essential and employability skills in occupational contexts.

*Performance Measure 3.a:*

**Language Arts and Mathematics Achievement Test Results by Individual Subject for Students in Grades 6 and 9**

***Rationale***

- Student results on Provincial Achievement Tests in each grade and subject provide detailed information on whether elementary and junior high students are achieving high standards in Language Arts and in Mathematics, an important outcome for Alberta's K–12 education system.

***Target***

- Targets for individual Language Arts and Mathematics subject results were not set in the 2022-25 business plan.

***Discussion***

- Results for 2019-20 and 2020-21 school years are not available as participation in the Provincial Achievement Tests was impacted by COVID-19-related learning disruptions.
- Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. Student data most likely impacted by these security breaches has been excluded from the overall results. Caution should be exercised when interpreting the results over time.
- The 2022-23 Provincial Achievement Test results do not include students who participated in the optionally implemented/piloted curriculum and were excused from writing in those subject areas.



### Percentages of Students in Grades 6 and 9 Who Achieved the Acceptable Standard on Provincial Achievement Tests in Language Arts *(in percentages)*

| Subject  | 2018-19 | 2019-20            | 2020-21 | 2021-22 | Previous<br>3-year<br>average | 2022-23 | Target<br>2022-23 |
|--|---------|--------------------|---------|---------|-------------------------------|---------|-------------------|
| Language Arts  |         |                    |         |         |                               |         |                   |
| Grade 6  |         |                    |         |         |                               |         |                   |
| English Language Arts                                  | 83.2    | Data not available |         | 76.1    | n/a                           | 76.2    |                   |
| French Language Arts                                   | 87.7    |                    |         | 76.9    | n/a                           | 77.6    |                   |
| Français   | 90.3    |                    |         | 83.0    | n/a                           | 78.9    |                   |
| Grade 9  |         |                    |         |         |                               |         |                   |
| English Language Arts                                  | 75.1    | Data not available |         | 69.6    | n/a                           | 71.4    |                   |
| English Language Arts<br>(Knowledge and Employability) | 57.4    |                    |         | 50.5    | n/a                           | 50.2    |                   |
| French Language Arts                                   | 82.9    |                    |         | 73.5    | n/a                           | 76.1    |                   |
| Français   | 88.6    |                    |         | 80.0    | n/a                           | 81.6    |                   |
| Overall Language Arts                                  |         |                    |         |         |                               |         |                   |
|  | 79.6    | Data not available |         | 73.5    | n/a                           | 73.7    | 80.6              |

Source: Alberta Education

#### Notes:

- Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. Student data most likely impacted by these security breaches has been excluded from the overall results. Caution should be exercised when interpreting the results over time.
- The 2019-20, 2020-21 and 2021-22 school years are not included in the previous three-year average and are denoted as n/a. Caution should be exercised when interpreting the results over time.
- The 2022-23 Provincial Achievement Test results do not include students who participated in the optionally implemented/ piloted curriculum and were excused from writing in those subject areas.
- The percentages of students who achieved the acceptable standard include the students who achieved the standard of excellence.
- Knowledge and Employability courses are designed for students who meet enrolment criteria and learn best through experiences that integrate essential and employability skills in occupational contexts.
- See Endnote A, page 9, for information on assessing results relative to targets and results over time.
- See Endnote B, Provincial Achievement Tests, pages 11-12.

## Percentages of Students in Grades 6 and 9 Who Achieved the Acceptable Standard on Provincial Achievement Tests in Mathematics *(in percentages)*

| Subject                                      | 2018-19 | 2019-20            | 2020-21 | 2021-22 | Previous<br>3-year<br>average | 2022-23 | Target<br>2022-23 |
|--|---------|--------------------|---------|---------|-------------------------------|---------|-------------------|
| Mathematics                                  |         |                    |         |         |                               |         |                   |
| Grade 6                                      |         |                    |         |         |                               |         |                   |
| Mathematics                                  | 72.5    | Data not available |         | 64.1    | n/a                           | 65.4    |                   |
| Grade 9                                      |         |                    |         |         |                               |         |                   |
| Mathematics                                  | 60.0    | Data not available |         | 53.0    | n/a                           | 54.4    |                   |
| Mathematics<br>(Knowledge and Employability) | 59.6    |                    |         | 55.3    | n/a                           | 52.7    |                   |
| Overall Mathematics                          |         |                    |         |         |                               |         |                   |
|  | 66.6    | Data not available |         | 59.9    | n/a                           | 59.6    | 67.4              |

**Source:** Alberta Education

### Notes:

- Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. Student data most likely impacted by these security breaches has been excluded from the overall results. Caution should be exercised when interpreting the results over time.
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## Performance Measure Methodology

### Endnote A: Technical Notes

#### Assessing Results Relative to Targets

Performance targets set expectations for results within specific time frames and are the basis for planning improvements and assessing results that are within the sphere of influence of the ministry and school authorities. They are an important way to gauge whether the education system is improving or falling behind in obtaining desired results in key areas. Targets clearly establish desired levels of performance better than recent performance, to be attained within a specific time frame. Targets are quantifiable and expressed in numerical terms, such as percentages or ratios. They are used as a key tool to drive, measure, improve and manage performance.

For measures based on achievement tests, a one-sample Chi-square statistical test is used to determine whether the result is significantly different from the target and whether the target is met, not met or exceeded. The magnitude of the difference required between the result and the target to establish significance depends on the sample size (e.g., the number of students writing an exam and the proportion of students meeting standards).

#### Assessing Results Over Time

Changes over time are assessed with a two-sample Chi-square statistical test for measures based on tests of student learning or on administrative data (i.e., derived from tracking groups of students over time, such as participation rates in Language Arts Provincial Achievement Tests). The test determines whether the difference between two proportions (e.g., base year and current year results) is significant. The calculation of Chi-square is based on the difference between what was observed and what would be expected assuming that the proportions were the same. Under a simple test of proportions, a Chi-square value of “1” represents a difference of one standard deviation, while a Chi-square value of 3.84 is significant at the five per cent level.

#### Trend Lines

Although not appearing in the annual report update, trend lines are an aid to interpreting the results for measures reported in the annual report update. Trend lines augment data interpretation techniques already in use to determine the significance of changes in measure results over time.

Trend lines are used to develop an expected value for a current result given historical results. The expected value can then be compared with the actual result. In this way, trend lines provide a useful method of understanding year-to-year fluctuations and shift the focus from smaller year-to-year changes by providing information about the direction of results over the longer-term. In particular, it is of interest whether results are tracking towards the performance target for the measures that have not met targets.

Discussion of results over time for measures with at least three data points is supported by trend lines. The type of trend line used is selected based on an informed interpretation of the data series underlying the trend.

Logarithmic trend lines are appropriate for proportional data, i.e., data expressed as percentages of a whole and therefore ranging between zero and 100 per cent, such as the performance measures

in this report. A logarithmic trend line is a best-fit straight line that is most useful when the rate of change in the data increases or decreases quickly, then levels out.

A logarithmic trend line is calculated using the following formula:

$Y = c \ln(x) + b$ , where  $c$  and  $b$  are constants and  $\ln( )$  is the natural logarithm function and  $x$  is the year of the series.

## **Endnote B: Methodology for Performance Measures**

Described below are the methodologies used to calculate the measures that are derived from provincial assessments of student learning and from other information about Alberta students in the Ministry of Education's data systems.

### **Definition of Alberta Student**

Starting from 2013-14, the definition of an Alberta student is an individual who is registered as of September 30 of the school year in a school located in Alberta, where "school" means a structured learning environment through which an education program is offered to a student by: a board (includes public, separate, Francophone, Lloydminster); an operator of a private school; an early childhood services (ECS) program private operator; the operator of a charter school; a parent giving a home education program; the Minister. It also includes other Alberta-located educational institutions providing ECS to Grade 12 curriculum instruction, specifically Federal (First Nations' schools and those operated by Corrections Canada); and provincial authorities (such as Bow Valley College and NorQuest College).

### **Provincial Achievement Tests**

Students in Grades 6 and 9 write Provincial Achievement Tests annually in Language Arts and Mathematics along with Science and Social Studies. The achievement test results for Grades 6 and 9 provide information on how well Alberta students in public, separate, Francophone, charter and accredited private schools are meeting provincial standards in the core academic subjects. Tests are developed and administered by teachers and educators and are based on the provincial curriculum. Results are reported in relation to the acceptable standard and standard of excellence.

A student achieving the acceptable standard in a specific grade shows an adequate understanding of the core knowledge and adequate basic skills essential to that course. A student achieving the standard of excellence consistently shows a deeper understanding of the concepts of the course by demonstrating an ability to integrate information and evaluate it from various points of view.

For each achievement test, the cut scores for the acceptable standard and the standard of excellence are set initially by a standard-setting committee of about 20 teachers selected from across the province using the Modified Angoff and Bookmark Standard Setting Procedures. These procedures use teachers' judgment to determine a minimum number of items a student must answer correctly (i.e., the cut score) to achieve each standard. In subsequent years, the cut scores for each test are adjusted through test equating. This ensures the standards remain constant even if test difficulty varies slightly from year to year. Whenever curriculum is revised, the standard-setting process is done again.

Results on these tests are calculated and presented on the basis of the total number of students in each grade who demonstrated the standards. Results for mathematics include student results on both English and French versions of the tests. Historically, given the large number of students in each grade (more than 40,000), typically differences in results from year-to-year of more than 0.4 percentage points on each test are considered significant. French Language Arts and Français courses have higher significant difference values (1.0 to 3.1 percentage points, depending on the number of students in each course) because fewer students are in these courses.

Not all students write the Provincial Achievement Tests. Achievement test results are not available for students who:

- were absent;
- were excused from writing by the superintendent because participation would be harmful to the

- student or the student could not respond to the test instrument;
- wrote but whose results were withheld or invalidated; or
- wrote only one part of the two-part Language Arts or only Part A of the Grade 6 Mathematics Test.

It is possible that some of these students, under different circumstances, could have demonstrated achievement of standards on the test.

Participation rates in achievement tests are calculated by dividing the number of students in the grade who wrote the test by the sum of total enrolment in the grade plus the ungraded students who are in the corresponding year of schooling.

Provincial overall results in Language Arts and Mathematics present weighted averages based on the number of students enrolled in each course. Test results and participation are recorded and aggregated in ministry systems. Provincial, school authority and school results are available at [Provincial Achievement Tests](#).

In this report update, results for 2019-20 and 2020-21 are not available due to the impact of COVID-19-related learning disruptions. Participation in the Provincial Achievement Tests was impacted by the wildfires in 2018-19 and 2022-23, by the COVID-19 pandemic in 2019-20, 2020-21 and 2021-22, and by the security breaches that occurred over the last few days of the 2021-22 Provincial Achievement Test administration window. To maintain the validity of provincial results, student data most likely impacted by these security breaches has been excluded from the overall results. Additionally, the 2022-23 Provincial Achievement Test results do not include students who participated in the optionally implemented/piloted curriculum and were excused from writing in those subject areas. Caution should be exercised when assessing results relative to targets, and when interpreting the results over time.