

Provincial Assessment Results 2022-23: Grades 4, 6, and 8 Scientific Literacy

Background

Scientific Literacy Assessments were administered to Grade 4, 6, and 8 students in the spring of 2023 to assess scientific literacy skills. The grade 4 assessment contained 30 items and the grades 6 & 8 assessments contained 29 items. All three assessments covered topics in three outcome strands: *Investigation* (formally *Initiate and Plan & Perform and Record*), *Sensemaking* (formally *Analyze and Explain*), and *Responsible and Sustainable Application*.

In keeping with the Department's assessment protocols, test items were developed by groups of New Brunswick educators, including Grades 4, 6, and 8 classroom teachers and experienced subject area experts. Assessment items were then field-tested and verified through a provincial pilot.

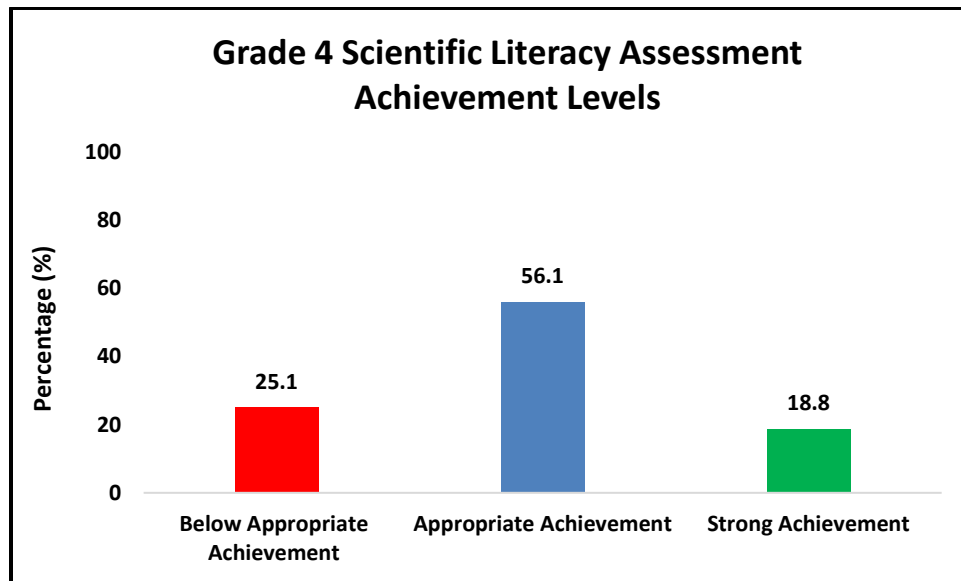
Since 2021-22, provincial assessments have been administered using an online platform. Students have unlimited access to an online assessment practice to familiarize themselves with the platform prior to the assessment period.

In 2021-22 a mode study was conducted to identify any impact or bias resulting from migration to the online platform. Traditional paper versions of the tests were administered to ten percent of students, while the rest completed the tests online. Results of statistical analyses indicated:

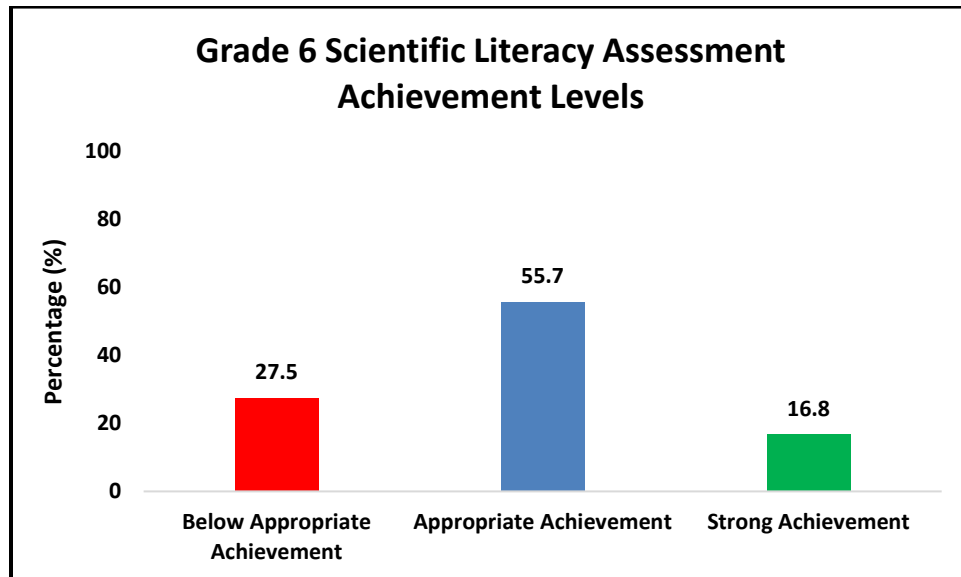
- Online versions were statistically equivalent to the paper versions.
- Test reliability was comparable to the previous year.
- Test items performed without bias for students in all programs of study and for students with accommodations.

All Scientific Literacy assessments are fully bilingual, and students may complete the assessment in the language of their choice. Warranted accommodations are provided to include as many students as possible in the provincial assessment program. Universal accommodations included coloured background, text-to-speech, Dyslexic font, and text magnification. In certain circumstances, it is necessary and fitting for students to be exempted from participation. This is the case when the testing format is not suitable for a student to demonstrate their learning, even with accommodations. For further information, please consult the [Provincial Assessment Program: Protocols for Accommodations and Exemptions](#).

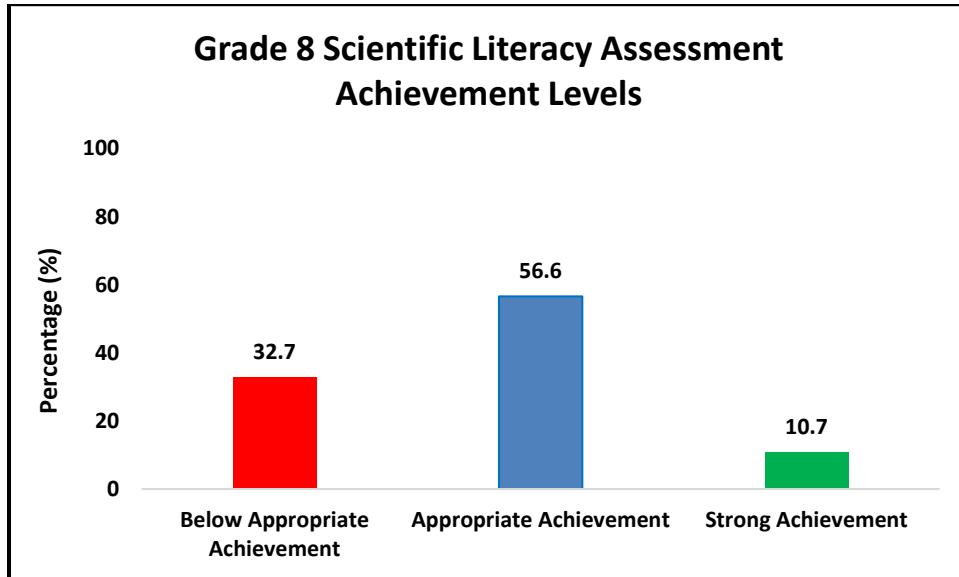
Of the 5472 Grade 4 students enrolled, 74.9% were successful (18.8% attained *Strong Achievement* and 56.1% attained *Appropriate Achievement*). The 25.1% of the students in the *Below Appropriate Achievement* group includes exempted students (4.4%) but excludes students who are absent during the assessment administration period (2.0%).



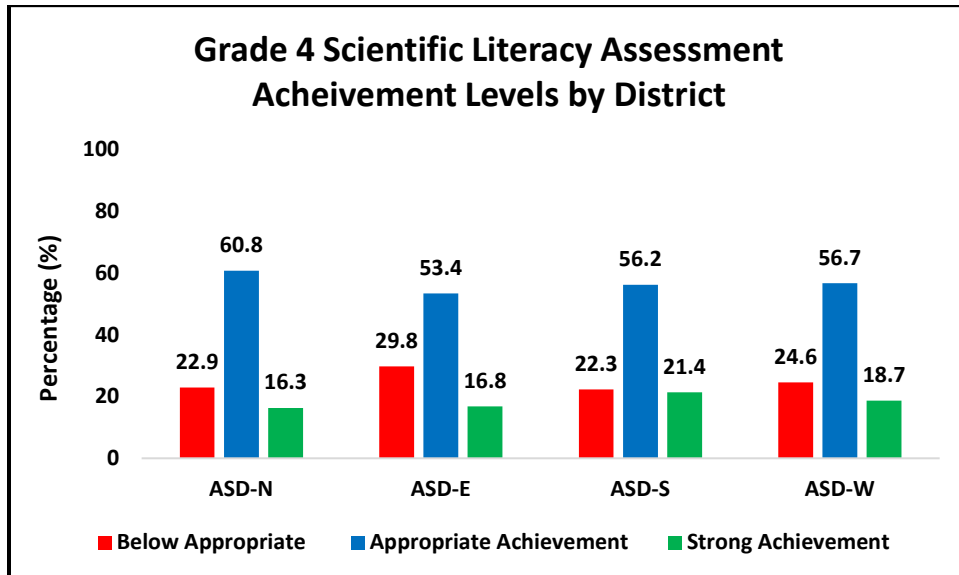
Of the 5621 Grade 6 students enrolled, 72.5% were successful (16.8% attained *Strong Achievement* and 55.7% attained *Appropriate Achievement*). The 27.5% of the students in the *Below Appropriate Achievement* group includes exempted students (3.5%) but excludes students who are absent during the assessment administration period (3.8%).



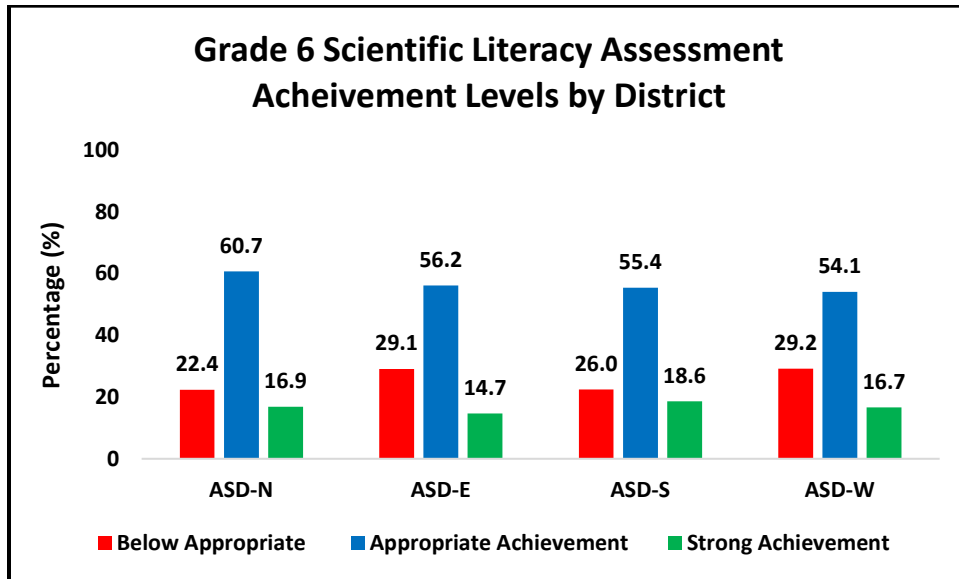
Of the 5856 Grade 8 students enrolled, 67.2% were successful (10.7% attained *Strong Achievement* and 56.6% attained *Appropriate Achievement*). The 32.7% of the students in the *Below Appropriate Achievement* group includes exempted students (3.0%) but excludes students who are absent during the assessment administration period (5.9%).



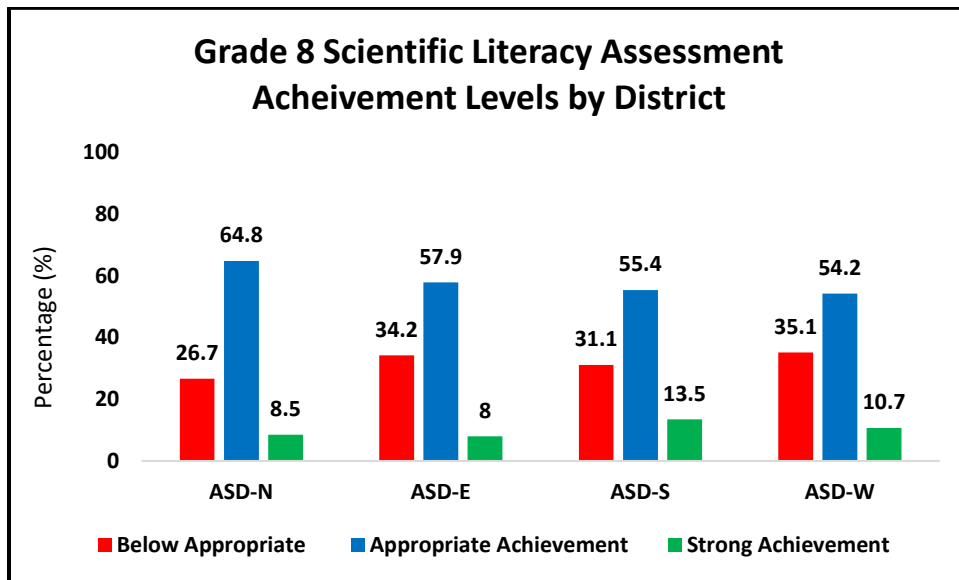
The graph below indicates the success rates for the province and for each school district. District success rates are as follows: ASD-N = 77.1%; ASD-E = 70.2%; ASD-S = 77.6%; ASD-W = 75.4%.



The graph below indicates the success rates for the province and for each school district. District success rates are as follows: ASD-N = 77.6%; ASD-E = 70.9%; ASD-S = 74.0%; ASD-W = 70.8%.



The graph below indicates the success rates for the province and for each school district. District success rates are as follows: ASD-N = 73.3%; ASD-E = 65.9%; ASD-S = 68.9%; ASD-W = 64.9%.



Warranted accommodations are provided to include as many students as possible in the provincial assessment program. In certain circumstances, it is necessary and fitting for students to be exempted from participation. This is the case when the testing format is not suitable for a student to demonstrate their learning, even with accommodations. For further information, please consult the [Provincial Assessment Program: Protocols for Accommodations and Exemptions](#).

Exemption rates for the *Scientific Literacy Assessments* are displayed in the tables below.

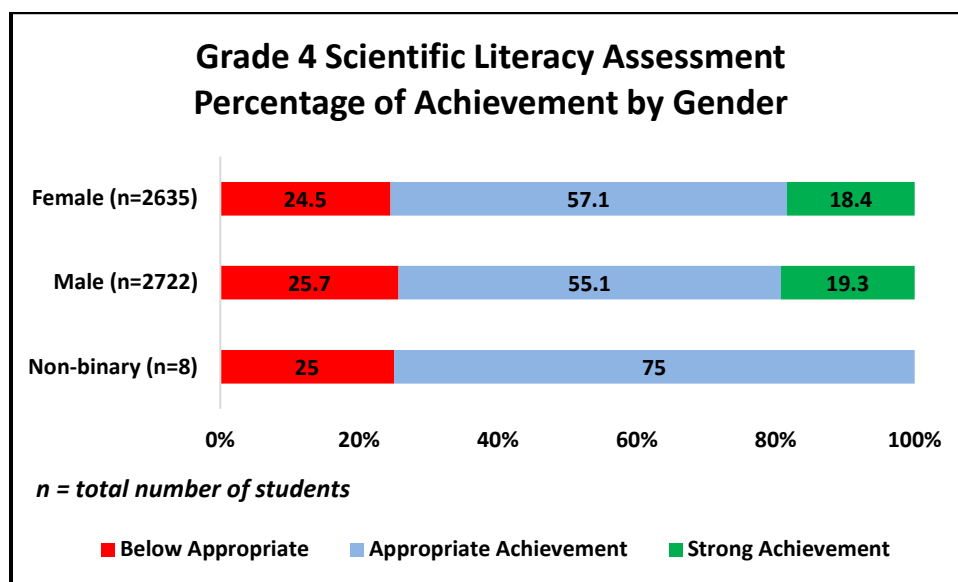
Grade 4 Scientific Literacy Assessment Exemption Rates				
District	Number of Students	Number of Students Exempt	Percent Exempt	Success Rate Excluding Exemptions
Province	5365	236	4.4	78.4%
ASD-North	520	13	2.5	79.1%
ASD-East	1369	96	7.0	75.5%
ASD-South	1697	67	3.9	80.8%
ASD West	1779	60	3.4	78.1%

Grade 6 Scientific Literacy Assessment Exemption Rates				
District	Number of Grade 6 Students	Number of Exempt Students	Percent Exempt	Success Rate Excluding Exemptions
Province	5409	189	3.5	75.1%
ASD-North	539	4	0.7	78.1%
ASD-East	1341	56	4.2	74.0%
ASD-South	1734	61	3.5	76.7%
ASD West	1795	67	3.7	73.6%

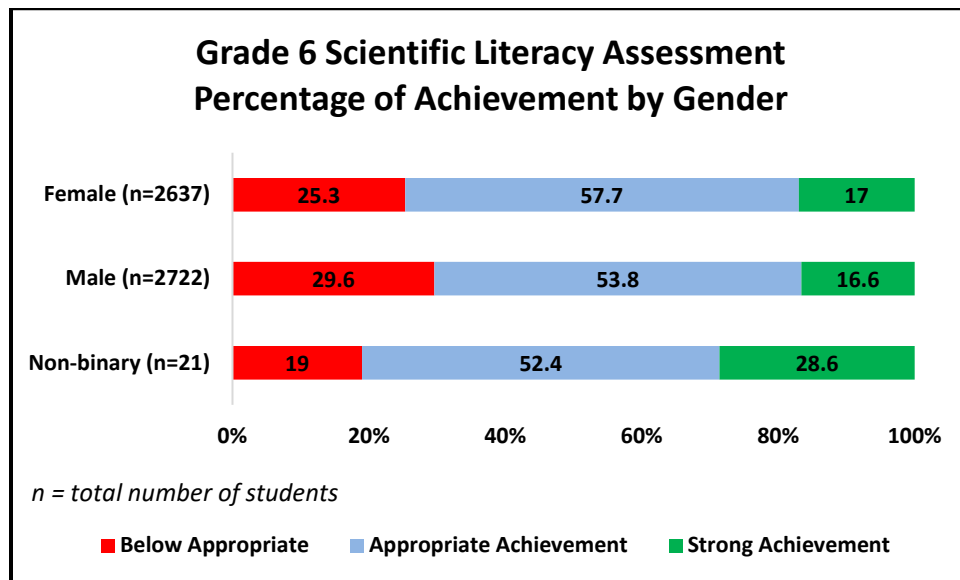
Grade 8 Scientific Literacy Assessment Exemption Rates				
District	Number of Students	Number of Students Exempt	Percent Exempt	Success Rate Excluding Exemptions
Province	5511	168	3.0	69.3%
ASD-North	532	5	0.9	74.0%
ASD-East	1432	67	4.7	69.1%
ASD-South	1743	49	2.8	70.9%
ASD West	1804	47	2.6	66.6%

The following graphs illustrate achievement levels by gender. Gender designations for this analysis were retrieved from administrative data contained in the provincial Student Information System.

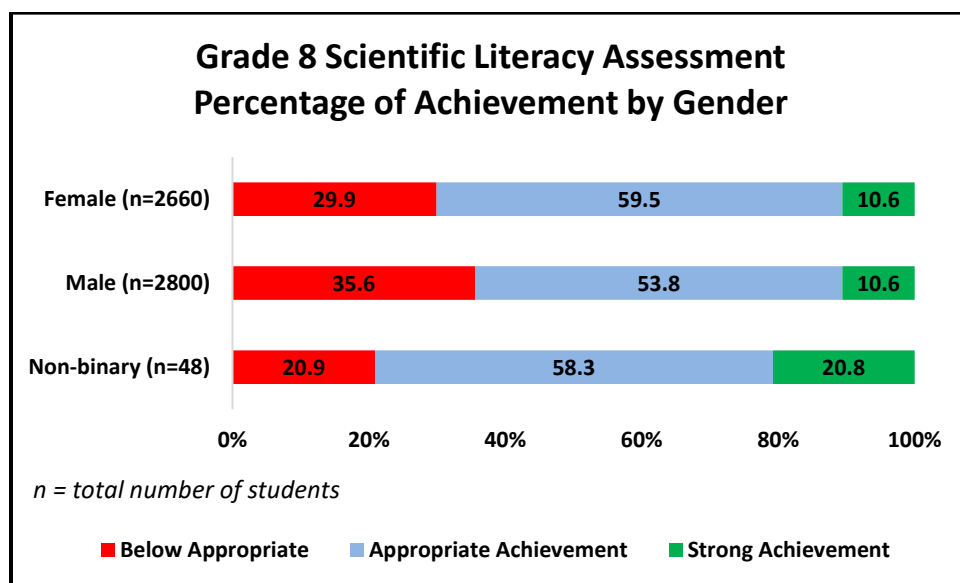
Grade 4: Combining *Appropriate* and *Strong* achievement levels, the success rate was 75.6% for female students, 74.4% for male, and 75.0% for non-binary students. Although there are few students in the latter group (8), results are included to provide a complete provincial picture and a baseline for anticipated increases in the number of students in this group over time.



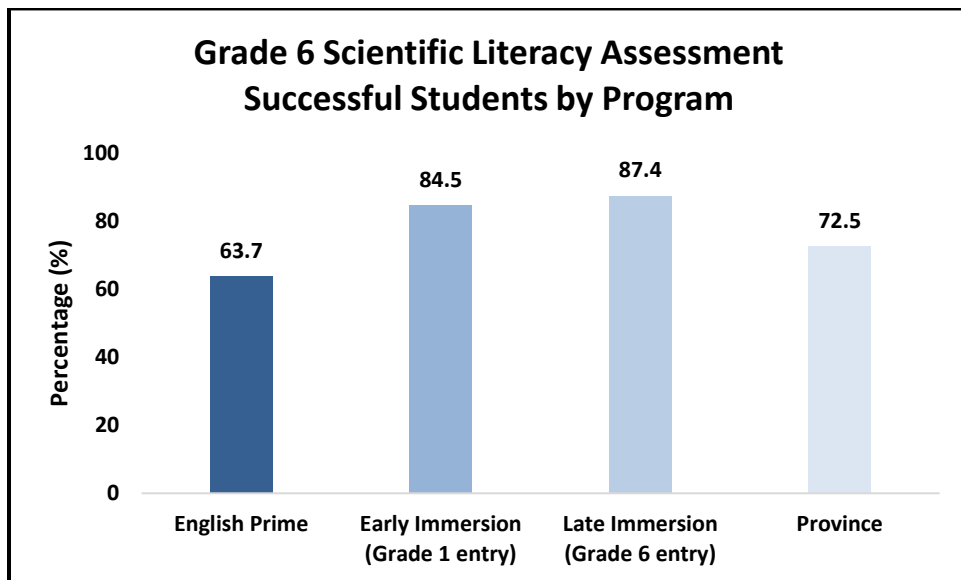
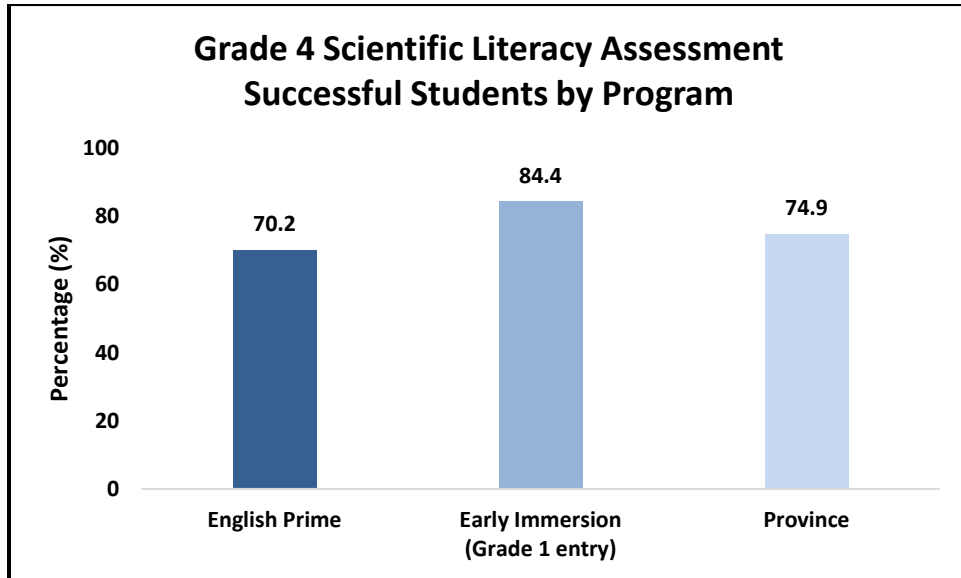
Grade 6: Combining *Appropriate* and *Strong* achievement levels, the success rate was 74.4% for female students, 70.4% for male, and 81.0% for non-binary students. Although there are few students in the latter group (21), results are included to provide a complete provincial picture and a baseline for anticipated increases in the number of students in this group over time.

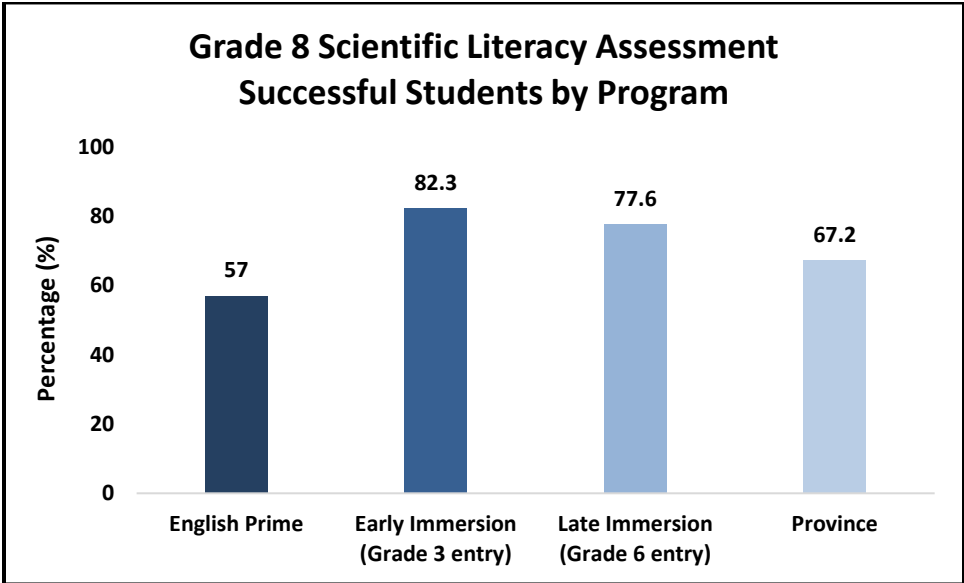


Grade 8: Combining *Appropriate* and *Strong* achievement levels, the success rate was 70.1% for female students, 64.4% for male, and 79.2% for non-binary students, and does not include exempted students. Although there are few students in the latter group (48), results are included to provide a complete provincial picture and a baseline for anticipated increases in the number of students in this group over time.

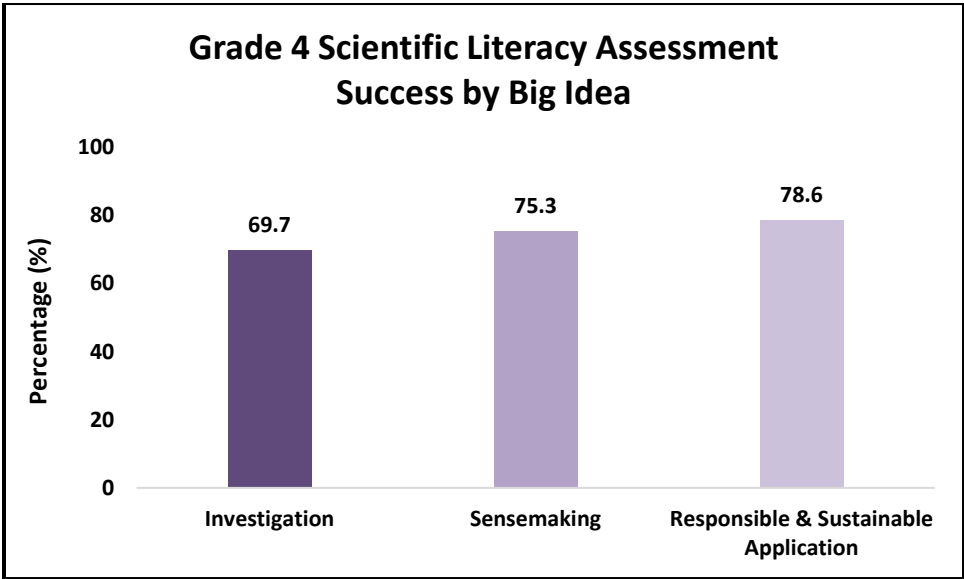


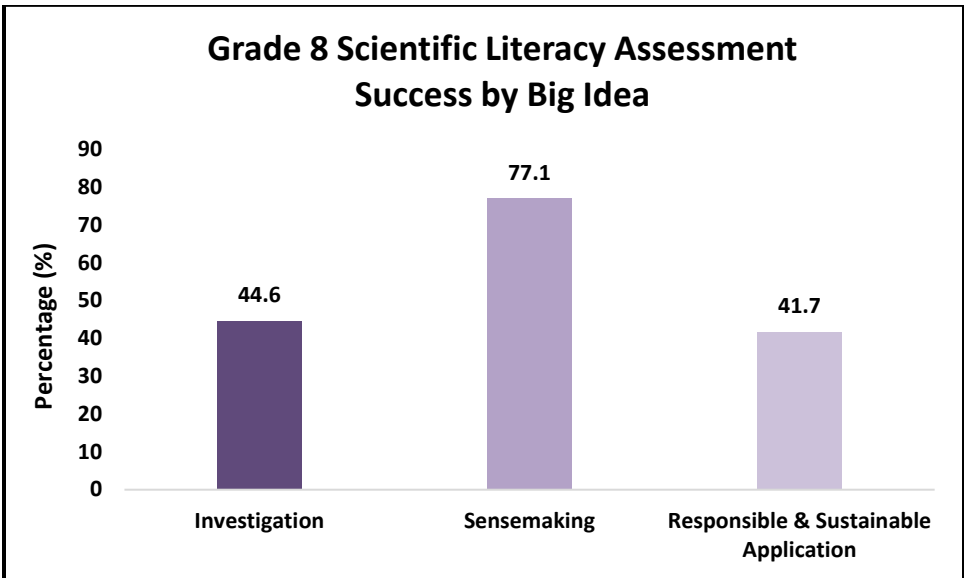
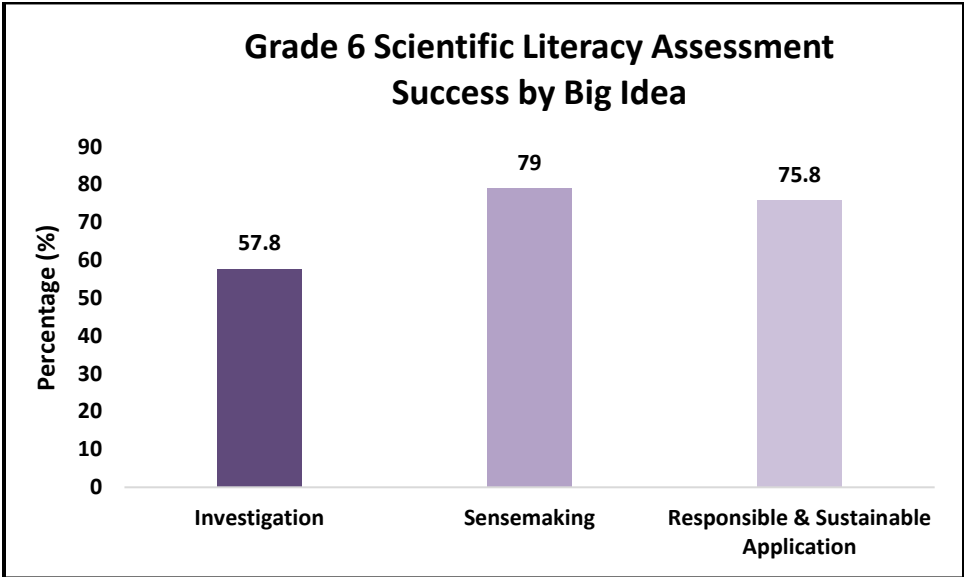
The graphs below indicate student success rates by language program.





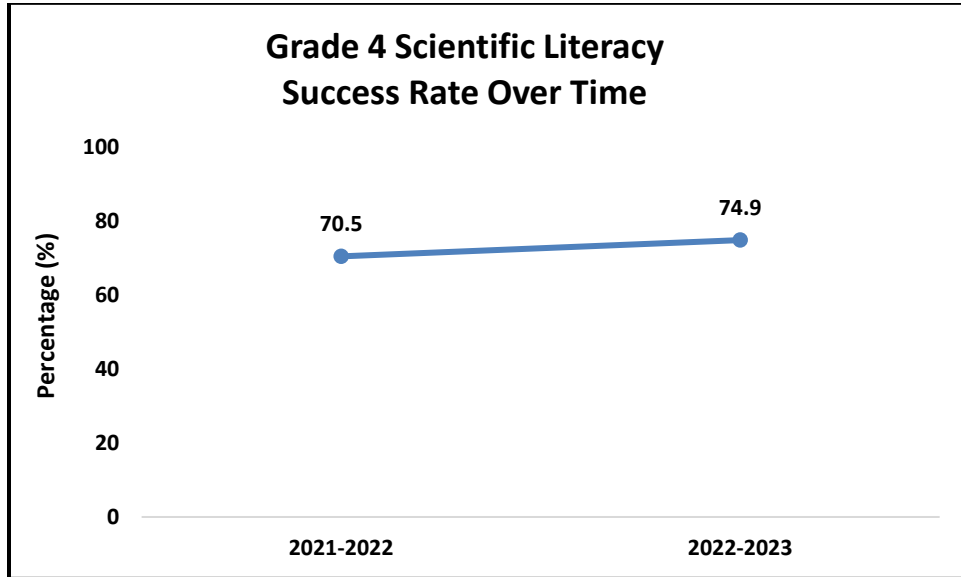
The assessment includes three Big Ideas: *Investigation* (formally *Initiate and Plan & Perform and Record*), *Sensemaking* (formally *Analyze and Explain*), and *Responsible and Sustainable Application*.



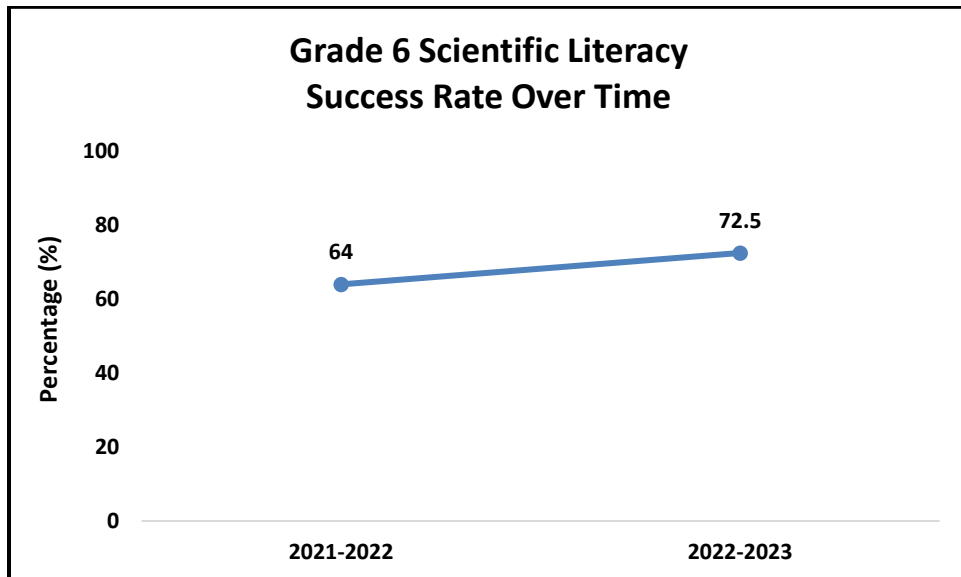


The following graph includes the baseline established in 2020-21. Performance of the 2022-23 Grade 4 & 6 cohorts are statistically different from that of the 2021-22 cohort.

Since the implementation of the online assessment program last year in New Brunswick, students in grade 4 have increased their success rate by 4.4%.



Since the implementation of the online assessment program last year in New Brunswick, students in grade 6 have increased their success rate by 8.5%.



**Description of the *Appropriate Achievement Level*
for the *Scientific Literacy skills – Grade 4***

Investigation

- I can ask questions about familiar objects and events that lead to simple investigations.
- I can make predictions, based on prior knowledge, about objects and events.
- I can identify the measured variable.
- I can identify the variable being changed.
- I can suggest a problem statement for a technological solution.
- I can suggest steps to conduct a fair test to answer a question.
- I can record data using formal measurements (where appropriate).

Sensemaking

- I can create simple labelled drawings, tables, bar graphs, or other formats to represent data.
- I can classify objects and events according to one or more properties.
- I can identify new questions that result from investigations.
- I can review ideas/useful information that can be used to answer initial questions.
- I can review ideas/useful information that can be used to solve a problem.

Responsible and Sustainable Application

- I can identify human behaviours that can lead to responsible use of Earth materials.
- I can safely use equipment while carrying out an inquiry.
- I can distinguish between scientific facts, beliefs, and opinions when answering scientific questions.

**Description of the *Appropriate Achievement Level*
for the *Scientific Literacy skills – Grade 6***

Investigation

- Ask questions that arise from careful observation of phenomena, models or unexpected results.
- Consider appropriate variables (e.g. dependent, independent, and control) to formulate a hypothesis.
- Select appropriate tools, materials, and equipment to carry out a fair test.
- Describe the investigation procedures for a fair test or a solution to a practical problem. Identify possible sources of error.
- Record qualitative and quantitative data using measurement tools as appropriate.

Sensemaking

- Construct graphical displays (e.g., drawings, charts, maps, tables, and graphs).
- Interpolate or extrapolate from a data pattern or trend.
- Classify objects and events.
- Obtain information from sources and/or other reliable media to support results.
- Use data (evidence) to confirm or refute the hypothesis or initial problem.

Responsible and Sustainable Application

- Follow guidelines for safe use of equipment to conduct a scientific experiment.

**Description of the *Appropriate Achievement Level*
for the *Scientific Literacy skills – Grade 8***

Investigation

- Ask questions that arise from careful observation of phenomena, models or unexpected results.
- Determine variables (e.g. dependent, independent, and control) to formulate a hypothesis.
- Select appropriate tools, materials, and equipment to carry out a fair test.
- Develop investigation procedures for a fair test.
- Record qualitative and quantitative data using measurement tools as appropriate.

Sensemaking

- Evaluate the accuracy of various methods for collecting data.
- Identify possible sources of error.
- Construct graphical displays (e.g. drawings, charts, maps, tables, and graphs).
- Apply concepts of probability and statistics (e.g. mean, median, mode, and variability).
- Draw a conclusion based on evidence gathered from scientific experiment or testing of a prototype.

Responsible and Sustainable Application

- Follow guidelines for safe use of equipment to conduct a scientific experiment.
- Reflect on various aspects of an issue to make decisions about possible actions.
- Differentiate between adaptation and mitigation measures as solutions to climate change.