Canada

Ashley Rostamian
Council of Ministry of Education, Canada

Introduction

Overview of Education System

In Canada, provinces and territories hold exclusive constitutional jurisdiction over education. As such, Canada does not have a single centralized education system or a national curriculum. Rather, school systems are overseen by a Ministry or Department of Education in each of the 10 provinces and three territories. The important roles, rights, and responsibilities for parents, students, and the education system are outlined in the School Act for each province and the Education Act for each territory.

Education systems across Canada consist of various school settings: public, separate, charter, on reserve, private, and homeschool. In public school systems across Canada, school boards/districts are demarcated by geography and language (i.e., Anglophone and Francophone). In three provinces, Ontario, Alberta, and Saskatchewan, students have a constitutional right to attend a publicly funded Catholic separate school.[1] Charter schools exist only in Alberta. Indigenous student populations can also attend on-reserve schools. In private school systems, funding is usually fee-based, with some provinces providing partial funding that is typically conditional upon certain criteria (e.g., employment of certified teachers). Alternatively, instead of institutional forms of schooling, parents may opt to have their children complete homeschooling.

Kindergarten to Grade 12 in Canada is generally divided between two levels: elementary (i.e., primary) and secondary. Although not mandatory in most provinces and territories, a large majority of students begin schooling in either Junior Kindergarten (JK) at the age of 4 or Senior Kindergarten (SK) at the age of 5. Formal elementary schooling begins in Grade 1, typically at the age of 6. Students transition to secondary school in either Grade 7 (in Quebec, Secondary I) or 9 (in Quebec, Secondary II), normally at the age of 12 or 14. Although most provinces and territories mandate schooling until age 16, some provinces and territories require schooling until the age 18, which marks the end of secondary school. In Quebec, there is an additional level of publicly funded post-secondary nontertiary schooling: *Collège d'enseignement général et professionnel* (*CÉGEP*), or in English, the College of General and Vocation Education. This level of schooling is unique to Quebec and is a prerequisite for university studies. Despite this structural difference between Quebec and the rest of Canada, students typically have a comparable number of years of mandatory schooling.

In most provinces and territories, streaming (i.e., tracking) starts in Grade 9 depending on the subject area. Curriculum content is tailored to meet the demands of each academic stream. For instance, in Ontario, the majority of lower secondary courses fall into the "applied" or "academic" category: applied courses are built on practical applications and concrete examples, whereas academic courses focus more on theory and abstract problem solving. At the upper secondary level, courses are normally characterized by destination-based streaming, leading to university, college, or the workplace.

Canada's two official languages, English and French, are the typical languages of instruction. Students are typically enrolled in their first language. However, French immersion programming is offered in the public school system for students interested in learning French as a second language.[2] Students in immersion programs learn French through the delivery of other subjects in the French language. In the 2015–2016 school year, just under 430,000 students were enrolled in French immersion programming.[3]

Other language programs are offered as alternative programs. For instance, the Ministry of Education in Alberta offers provincewide programs of study in eight international languages at the elementary level (from kindergarten to Grade 6): Arabic, Chinese, German, Italian, Japanese, Punjabi, Spanish, and Ukrainian. These programs give students an opportunity to learn an international language and culture with the goal of building communication and intercultural skills. They provide instruction in other subject areas using the international language for up to 50 percent of the school day.

Use and Impact of TIMSS

Canada has been a participating country in TIMSS since the first administration in 1995. In 2003, only two provinces, Ontario and Quebec, participated as benchmarking participants. In 2007, the provinces of Alberta (Grade 4 only) and British Columbia also participated. In 2011, Alberta, Ontario, and Quebec participated as benchmarking participants at both the Grade 4 and Grade 8 levels. Five provinces participated in TIMSS 2015: Alberta (Grade 4 only); Ontario and Quebec (as benchmarking participants); and Manitoba and Newfoundland and Labrador (as part of the Canadian sample). In 2019, the most recent TIMSS administration, Alberta, Manitoba, and Newfoundland and Labrador participated at the oversampling level (Grade 4 only), while Ontario and Quebec continued to participate as benchmarking participants at the Grade 4 and Grade 8/Secondary II levels.

TIMSS results are used alongside results from other provincial, national, and international student assessments to monitor student academic outcomes. Moreover, in the particular context of Canada, TIMSS provides the opportunity to evaluate mathematics and science outcomes between participating provinces.

The Mathematics Curriculum in Primary and Lower Secondary Grades

Mathematics curricula in Canada cover a majority of TIMSS 2019 assessment content. However, given that each province and territory is responsible for its education system, there is interprovincial/territorial variation in the prescription and coverage of mathematics curricula to reflect each province's/territory's unique context. Despite these differences, there is considerable overlap, sometimes through intentional collaborative efforts to create comparability in student learning.

For instance, as described in Canada's TIMSS 2015 Encyclopedia chapter, the Western and Northern Canadian Protocol (WNCP) established the Common Curriculum Framework for K–9 Mathematics in May 2006. Four western provinces (Alberta, British Columbia, Manitoba, and Saskatchewan) along with the three territories (Northwest Territories, Nunavut, and Yukon) partnered to develop the framework, which serves to provide a common curricular base to achieve consistency in student outcomes and transferability for students in their mathematics learning across these provinces/territories.[4] This framework outlines the following four major strands, along with substrands:

- Number—Number Sense
- Patterns and Relations—Patterns, and Variables and Equations
- Shape and Space—Measurement, Three-Dimensional Objects and Two-Dimensional Shapes, and Transformations
- Statistics and Probability—Data Analysis, Chance and Uncertainty

The Atlantic provinces have also collaborated through the Council of Atlantic Ministers of Education and Training (CAMET) to develop an overarching interprovincial guide of mathematics curriculum and to foster cooperation in education from preprimary to post-secondary levels among the provinces of New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island. CAMET's mathematics framework major strands align with frameworks developed by WNCP.

Mathematics strands vary slightly from those identified by WNCP and CAMET in the provinces that are not part of these agreements. In Ontario, there are five major strands that are akin to other provinces'/territories' mathematics content:

- Number Sense and Numeration
- Measurement
- Geometry and Spatial Sense
- Patterning and Algebra
- Data Management and Probability[5]

In Quebec, the curriculum is also organized into five major strands similar to those found in the other provinces:

- Arithmetic
- Geometry
- Measurement
- Statistics
- Probability[6]

In addition to mathematical content, mathematics curriculum documents across Canada also specify mathematical skills and processes that students are expected to learn and apply. These skills may or may not be specific to mathematics learning. Some of them include problem solving, reasoning, proving, reflecting, selecting tools and computational strategies, connecting, representing, communicating, visualizing, using technology, and completing mental mathematics and estimation, among others.

Across Canada, instruction time can be prescribed by either the province's Ministry of Education or the local school board/school district. Otherwise, teachers may have full discretion to determine instructional time per subject. In Canada, across the provinces and territories, approximately 15 to 20 percent of instructional hours in Grade 4 are devoted to teaching mathematics.

The Science Curriculum in Primary and Lower Secondary Grades

Similar to the mathematics curriculum, the science curriculum documents are also subject to provincial/territorial variation in content prescription and coverage.

The Common Framework of Science Learning Outcomes K to 12 specifies curricular expectations that are valued in the development of Canadian students' scientific literacy. The framework calls for the development of scientific literacy foundations to guide Grade 4 learning outcomes in the following ways:

- Foundation 1: Science, technology, society, and the environment (STSE)—Students will develop an understanding of the nature of science and technology, of the relationships between science and technology, and of the social and environmental contexts of science and technology.
- Foundation 2: Skills—Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions.
- Foundation 3: Knowledge—Students will construct knowledge and understandings of concepts in life sciences, physical sciences, and Earth and space sciences and apply these understandings to interpret, integrate, and extend their knowledge.
- Foundation 4: Attitudes—Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment.

The framework defines science through three domains: Life Science, Physical Science, and Earth and Space Science. Exhibit 1 outlines the topics and learning expectations for each of the domains in Grade 4.

Exhibit 1: Topics and Learning Expectations for Science Domains in Grade 4

Domain	Grade 4
Life Science	Habitats and communities ▪ Compare the external features and behavioral patterns of animals that help them thrive in different kinds of places ▪ Compare the structural features of plants that enable them to thrive in different kinds of places ▪ Predict how the removal of a plant or animal population affects the rest of the community ▪ Relate habitat loss to the endangerment or extinction of plants and animals ▪ Identify a variety of local and regional habitats and their associated populations of plants and animals ▪ Describe how a variety of animals are able to meet their basic needs in their habitat ▪ Classify organisms according to their role in a food chai
Physical Science	Light ▪ Identify sources of natural and artificial light in the environment ▪ Demonstrate that light travels in all directions away from a source ▪ Distinguish between objects that emit their own light and those that require an external source of light to be seen ▪ Investigate how a beam of light interacts with a variety of objects, to determine whether the objects cast shadows, allow light to pass, or reflect light ▪ Predict the location, shape, and size of a shadow when a light source is placed in a given location relative to an object/ ▪ Demonstrate and describe how a variety of media can be used to change the direction of light ▪ Demonstrate that white light can be separated into colors ▪ Compare how light interacts with a variety of optical devices, such as kaleidoscopes, periscopes, telescopes, and magnifying glasses Sound ▪ Describe how the human ear is designed to detect vibrations ▪ Compare the range of sounds heard by humans to that heard by other animals ▪ Demonstrate and describe how the pitch and loudness of sounds can be modified ▪ Identify objects by the sounds they make ▪ Relate vibrations to sound production ▪ Compare how vibrations travel differently through a variety of solids and liquids and through air
Earth and Space Science	Rocks, minerals, and erosion ▪ Compare different rocks and minerals from their local area with those from other places ▪ Describe rocks and minerals according to physical properties, such as color, texture, luster, hardness, crystal shape (minerals) ▪ Identify and describe rocks that contain records of Earth's history ▪ Relate the characteristics of rocks and minerals to their uses ▪ Describe ways in which soil is formed from rocks ▪ Describe effects of wind, water, and ice on the landscape ▪ Demonstrate a variety of methods of weathering and erosion ▪ Describe natural phenomena that cause rapid and significant changes to the landscape

Although the framework provides the domains, grade specific topics, and learning outcomes to guide science learning across the country, the conceptualization and coverage of these areas may vary greatly between provinces and territories. For instance, in addition to the domains, Alberta further classifies the Grade 4 science curriculum into five topics: Waste and our World; Wheels and Levers; Building Devices and Vehicles that Move; Light and Shadows; Plant Growth and Changes.[7] In Ontario, science is conceptualized slightly differently, with four domains across the Grade 1 to Grade 8 curriculum: Understanding Life Systems; Structures and Mechanisms; Matter and Energy; and Earth and Space.[8] In Quebec, domains (Material World, Earth and Space, and Living Things) are closely aligned with the framework. However, content topics are conceptualized differently as they are classified under the following concepts: matter; energy; forces and motion; and systems and interaction. Finally, in both Manitoba and Newfoundland and Labrador, the Grade 4 science curriculum is split into clusters,[9] or units,[10] that parallel the topics (i.e., Habitats and Communities; Light; Sound; and Rocks, Minerals, and Erosion) found in the Common Framework. However, the learning outcomes in each curriculum document are considerably more extensive.

Anywhere between 5 and 15 percent of total instruction time is devoted to science instruction in provinces in which the Ministry earmarks the amount of time devoted to science instruction.

Although curriculum renewal is generally an ongoing process across Canada, certain provinces (namely, Alberta, British Columbia, Nova Scotia, and Prince Edward Island) are in the process of revising their science curriculum. As of the 2019–2020 school year, schools in both British Columbia and the Yukon (which follows the British Columbia curriculum, with adaptations to include Yukon content and context) are using the new curriculum from kindergarten to Grade 12.

In addition to content, curriculum documents may specify teaching and learning methods. When designing their classroom mathematics and science programming, teachers incorporate a variety of methods to effectively and equitably meet the global needs of their diverse students. Some of these pedagogical methods are formally prescribed in curriculum documents across the subjects. As such, the science and mathematics curriculum transcend the prescription of subject-specific knowledge and skills that students are expected to achieve by the end of the academic year and point to higher-order thinking and learning processes. Some of the following are examples of how the curriculum documents across Canada guide the pedagogical practice of teachers to promote deep learning in mathematics, science, and more:

- Cross-curricular and Integrated Learning—Opportunities to learn may go beyond one subject area, so that students may acquire knowledge and skills in two or more subject areas during any given activity. Quebec, for instance, specifies "cross-curricular competencies" that go beyond a specific subject area and that all teachers, regardless of their teaching specialization, are expected to help students achieve.[11]

- Alternative Programming—To promote equitable opportunities to learn, the curriculum may be tailored to the unique needs of students. For example, if a student demonstrates certain individualized needs, Ontario teachers, with the support of other stakeholders, may create an Individual Education Plan (IEP) for the student. The IEP can prescribe two main forms of alternative programming: accommodations or modifications. Accommodations result in adjustments to the instruction, environment, or assessment of the student, without changing the grade level at which the student is expected to perform. Modifications, however, may specify learning expectations from a different grade level (i.e., a higher or lower grade). Modified curriculum expectations may result in changes to the number and complexity of assigned tasks.
- Indigenous Perspectives—Embedded in Manitoba's[12] and Alberta's[13] curriculum, for example, is the belief that student learning in mathematics must incorporate First Nations, Métis, and Inuit perspectives.
- Gradual Release of Responsibility—To ensure that students are learning and applying knowledge and skills with the appropriate amount of support, teachers scaffold their instruction. With this pedagogical practice, teachers first model the work before mentoring and, ultimately, monitoring it. This pedagogical practice is outlined, for instance, in Newfoundland and Labrador's curriculum.[14]

Professional Development Requirements and Programs

The organizational bodies responsible for regulating professional development requirements differ by province/territory. In most provinces and territories, teacher professional requirements are regulated by a Ministry or Department of Education. However, in Saskatchewan and Ontario, a regulatory body of teachers oversees the teaching profession, including the necessary requirements to enter and remain in the profession. Regardless of the organization responsible for teacher regulation, teaching in the public school system in any province/territory normally requires certification, which entails completion of an undergraduate degree along with a separate degree in education (i.e., bachelor's of education, master's of teaching, etc.). In addition to the theoretical and practical coursework, a teacher's education program includes an in-class practicum period under the supervision of a mentor teacher. Several provinces/territories have their own requirements to become fully certified, such as through an examination, probation period, or a mentoring or induction program.

Depending on the intended grade level, professional preparation and/or development may be required to teach mathematics or science. For instance, in Ontario, a preservice teacher who wishes to teach at the Junior or Intermediate level (i.e., Grades 4 to 10) must possess a specialty subject that can include mathematics or science, among other subjects.[15] Obtaining basic qualification in either subject typically requires university-level coursework, in addition to a degree in teaching. Moreover, in-service teachers may further hone their pedagogical skills and knowledge in a particular subject (including mathematics and science) through professional development in the

form of credentialed upgrading courses.[16] A combination of professional development courses can result in a postgraduate certificate, such as British Columbia's postgraduate certificate in mathematics education.[17] Specifically, to support teachers in developing their specific mathematics pedagogical competences, course reimbursement may be made available. As an example, Ontario's teachers' union, the Ontario Teachers' Federation, offered subsidies (from earmarked funding provided by the Ministry of Education[18]) to teachers taking mathematics professional development courses in April 2014 to April 2015, and again from February 2016 to December 2018. Further, though not a professional development provision, recent legislation in Ontario requires teachers to pass a mathematics proficiency assessment before entering the profession.[19]

Aside from formal credential-granting courses (i.e., additional qualifications, certificates, or graduate studies), a number of professional development opportunities exist for in-service teachers; teachers may or may not attend these programs during allocated professional development days. Professional development may occur in the form of workshops, conferences, professional learning communities, and more, and may be organized at the school, board/district level, provincial/territorial, or pan-Canadian level.

Monitoring Student Progress in Mathematics and Science

Student progress in mathematics and science is monitored at different levels and for different purposes. Assessments may either be administered at the local level, such as in the classroom, or at the provincial/territorial, pan-Canadian, or international levels through a large-scale assessment.

At the local level, teachers evaluate students through classroom-based assessment and report their students' achievement of curriculum expectations through progress report cards. Additionally, at the local level, teacher surveys may also provide opportunities to monitor mathematics and science programming.

Provincial assessments are administered at transitional times of student pathways, such as at the midpoints and endpoints of elementary education (e.g., Grade 3 and Grade 6), and in the intermediate years (e.g., Grade 9). Some provinces require successful completion of the assessment to graduate secondary school. For instance, in Ontario, Grade 10 students are required to successfully complete the Ontario Secondary School Literacy Test (OSSLT). In Newfoundland and Labrador, the provincial government administers Grade 12 certification examinations in language arts (English, French), mathematics, social studies (geography, history), and science (biology, chemistry, Earth systems, physics). Successful completion of at least one course in each area is a requirement to graduate from secondary school with an academic/honors distinction and to enter university.

At the pan-Canadian level, Grade 8 classes across the country may be randomly selected to participate in the Pan-Canadian Assessment Program (PCAP), which assesses students' with respect to their achievement of the curriculum expectations common to all provinces and territories in three core learning domains: reading, mathematics, and science. The information gained from this pan-

Canadian assessment provides ministers of education and other stakeholders with a basis for examining their curriculum and other aspects of their school systems.[20]

At the international level, assessments such as TIMSS, the Progress in International Reading Literacy Study (PIRLS), and the Programme for International Student Assessment (PISA) and are used to obtain insight into how Canadian education systems are functioning as well as important information about the possibilities for education improvement.

Beyond assessments, students' progress in mathematics and science are measured outside of test settings. Indeed, Newfoundland and Labrador's curriculum specifies the many ways that teachers employ methods and tools to evaluate the progress of their students' learning. Depending on the grade level and the activity, teachers may assess student understanding using anecdotes, audio/video clips, case studies, checklists, conferences, debates, demonstrations, documentation, exemplars, graphic organizers, journals, literacy, photographic, plays, podcasts, portfolios, presentations, profiles, projects, questions, quizzes, records, role, rubrics, self-assessments, tests, observations, and Wikis.[21]

In Canada, evaluation is conceptualized as *for* learning, *as* learning, and *of* learning.[22] Assessment *for* learning is diagnostic in nature; it is meant to provide an opportunity to measure student learning to formulate more appropriate future learning and teaching. Assessment *as* learning is formative in nature, as it provides students the chance to assess their own progress, as well as that of their peers. Finally, assessment *of* learning is summative and is typically used to measure a student's cumulative knowledge.[23]

Special Initiatives in Mathematics and Science Education

The federal government has earmarked funds in most recent federal budget proposals to foster growth in the science, technology, mathematics, and engineering (STEM) field. These funds support programming targeting students from elementary to post-secondary levels. Specifically, the federal government dedicated $73 million over four years to the Student Work Placement Program beginning in 2016–2017 to create more than 10,000 STEM and business jobs, as well as a further $11 million over three years beginning in 2018–2019 to create 1,500 work placements in cybersecurity and artificial intelligence fields.[24] In terms of educational programs, the federal budget also allocates funds to several initiatives to build STEM capacities in youth. Below are some examples:

- Beginning in 2019–2020, the federal government will invest $60 million over two years to develop students' coding and digital skills from kindergarten to Grade 12. The program, CanCode, seeks to engage traditionally underrepresented students, such as girls and Indigenous students, in STEM.
- Budget 2019 will provide $10 million over two years to programs such as Let's Talk Science and PromoScience, to engage students in hands-on activities in science.

Provinces and territories may individually or collaboratively decide upon and implement policies and programs to support learning opportunities in mathematics and science. For instance, in July 2019, Ontario and Alberta governments signed a memorandum of understanding to support learning opportunities in STEM for elementary and secondary students.[25]

Suggested Readings

Council of Ministers of Education, Canada. (2012). *Education in Canada: An overview*. Retrieved from http://www.cmec.ca/299/Education-in-Canada-An-Overview/index.html

Statistics Canada & Council of Ministers of Education, Canada. (2019). *Education indicators in Canada: An international perspective*. Retrieved from https://www150.statcan.gc.ca/n1/en/pub/81-604-x/81-604-x2019001-eng.pdf?st=aYxAx7Ci

References

1 Fletcher, R. (2018). *Why does Alberta still have a separate Catholic school system? Here's a 2-minute explanation.* Retrieved from https://www.cbc.ca/news/canada/calgary/why-alberta-saskatchewan-ontario-have-separate-catholic-schools-1.4614462

2 Canadian Parents for French. (n.d.). *Enrolment, recruitment and retention*. Retrieved from https://cpf.ca/en/activities-resources/for-educators/backgrounders/enrolment-recruitment-and-retention/

3 Statistics Canada. (2017). *Elementary-secondary education survey for Canada, the provinces and territories, 2015/2016.* Retrieved from https://www150.statcan.gc.ca/n1/en/daily-quotidien/171103/dq171103c-eng.pdf?st=lRFc8-DH

4 Western and Northern Canadian Protocol. (2016). *Home, subject area/projects.* Retrieved from http://www5.sd71.bc.ca/math/uploads/secondary/CCF_K_to_9.pdf

5 Ministry of Education, Ontario. (2005). *The Ontario curriculum Grades 1-8: Mathematics*. Retrieved from http://www.edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf

6 Quebec Education Program. (2001). *Chapter 6: Mathematics, science and technology*. Retrieved from http://www.education.gouv.qc.ca/fileadmin/site_web/documents/education/jeunes/pfeq/PFEQ_mathematique-primaire_EN.pdf

7 Alberta Education. (2003; Updated 2009, 2014). *Science Grades 7-8-9 program of studies 2003*. Retrieved from https://education.alberta.ca/media/3069389/pos_science_7_9.pdf

8 Ministry of Education, Ontario. (2007). *The Ontario curriculum Grades 1-8: Science and technology*. Retrieved from http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf

9 Manitoba Education. (1999). *Manitoba science: Kindergarten to Grade 4 topic charts*. Retrieved from https://www.edu.gov.mb.ca/k12/cur/science/outcomes/k-4/topic_charts.pdf

10 Government of Newfoundland and Labrador Department of Education. (2014). *Mathematics Grade 4 curriculum guide 2014*. Retrieved from https://www.gov.nl.ca/eecd/files/k12_curriculum_guides_mathematics_elementary_mathematics_grade_4_curriculum_guide_2014.pdf

[11] Quebec Education Program. (2001). *Chapter 2: Cross-curricular competencies.* http://www.education.gouv.qc.ca/fileadmin/site_web/documents/education/jeunes/pfeq/PFEQ_competences-transversales-primaire_EN.pdf

[12] Manitoba Education. (2013). *Kindergarten to Grade 8 Mathematics: Manitoba curriculum framework of outcomes (2013)*. Retrieved from https://www.edu.gov.mb.ca/k12/cur/math/framework_k-8/introduction.pdf

[13] Alberta Education. (2007). *Mathematics Kindergarten to Grade 9 program of studies*. Retrieved from https://education.alberta.ca/media/3115252/2016_k_to_9_math_pos.pdf

[14] Government of Newfoundland and Labrador Department of Education and Early Childhood Development. (2016). *Science Grade 4 curriculum guide 2016.* Retrieved from https://www.gov.nl.ca/eecd/files/k12_curriculum_guides_science_science_4_2016.pdf

[15] Ontario College of Teachers. (n.d.). *Teaching divisions, Ontario College of Teachers*. Retrieved from https://www.oct.ca/public/professional-standards/how-teachers-are-certified/initial-teacher-education/teaching-divisions

[16] Ontario College of Teachers. (n.d.). *Additional qualifications*. Retrieved from https://www.oct.ca/Home/Members/Additional%20Qualifications

[17] Queen's University. (2020). *BC Post-Grad Certificate—Mathematics Education.* Retrieved from https://coursesforteachers.ca/programs/BCMATH

[18] Ontario Teachers' Federation. (2019). *Frequently asked questions.* Retrieved from https://www.otffeo.on.ca/en/wp-content/uploads/sites/2/2019/01/AQ-FAQ-2019.pdf

[19] Alphonso, C. (2019). *Ontario unveils details of qualifying math tests for future teachers.* Retrieved from https://www.theglobeandmail.com/canada/article-ontario-to-start-testing-future-teachers-in-math-before-they-can/

[20] Council of Ministers of Education, Canada. (n.d.). *Pan-Canadian Assessment Program (PCAP), overview.* Retrieved from https://cmec.ca/240/Pan-Canadian_Assessment_Program_(PCAP).html

[21] Government of Newfoundland and Labrador Department of Education and Early Childhood Development. (2018). *Science Grade 6 curriculum guide 2018.* Retrieved from https://www.gov.nl.ca/eecd/files/Science_6_2018.pdf

[22] Earl, L. (2003). *Assessment as Learning: Using classroom assessment to maximise student learning.* Thousand Oaks, CA: Corwin Press.

[23] Ministry of Education, Ontario. (2010). *Growing success: Assessment, evaluation, and reporting in Ontario schools: First edition, covering Grades 1 to 12*. Retrieved from http://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf

[24] Government of Canada. (2019). *Budget 2019.* Retrieved from https://www.budget.gc.ca/2019/docs/youth-jeunes/youth-jeunes-en.html

[25] The Honorable Rod Phillips, Minister of Finance. (2019). *Ontario economic outlook and fiscal review chapter 1, section B: A plan to build Ontario together: By preparing people for jobs.* Retrieved from https://budget.ontario.ca/2019/fallstatement/pdf/2019-fallstatement.pdf