Ontario, Canada

Ontario Ministry of Education

Introduction

Ontario is one of 10 provinces alongside three territories in Canada, representing about 38% of the Canadian population.[1] There are approximately 14 million inhabitants in Ontario.[2] The official language of the province is English. Approximately 68% of Ontarians have English as their mother tongue,[a] 3% have French, and 28% have a first language other than English or French.[3] Approximately 3% of Ontario's population identify as Indigenous.[4] Within Canada, education is under the exclusive jurisdiction of each province and territory.

Overview of Education System

In Ontario, the Ministry of Education is responsible for delivering a high-quality publicly funded education system from kindergarten to Grade 12, as well as overseeing the province's childcare and early years system. The Ministry is committed to ensuring all children and students have the skills and knowledge they need to reach their full potential and achieve lifelong success, and that their parents and families are also supported. In Ontario, kindergarten to Grade 12 public education is governed principally by the Education Act.

The Education Act and its regulations set out the duties and responsibilities of the Minister of Education and the duties and responsibilities of school boards, school board supervisory officers, principals, teachers, parents, and students. The Child Care and Early Years Act (CCEYA) establishes the rules for childcare and early years programs and services in Ontario and authorizes the Minister of Education to issue policy statements regarding programming and pedagogy for the purpose of guiding operators of childcare and early years programs and services.[5]

Canada's two official languages, English and French, are the languages of instruction in English-language and French-language schools across Ontario. As per the Education Act, American Sign Language (ASL) and Quebec Sign Language (*Langues des signes québécoise*) may also be used as languages of instruction.

a Statistics Canada defines "mother tongue" as the first language learned at home in childhood and still understood by the person at the time the data were collected. If the person no longer understands the first language learned, the mother tongue is the second language learned. For a person who learned two languages at the same time in early childhood, the mother tongue is the language this person spoke most often at home before starting school. The person has more than one mother tongue only if the person learned more than one language at the same time and still understands these languages. For a child who has not yet learned to speak, the mother tongue is the language spoken most often to the child at home. A child who has not yet learned to speak has more than one mother tongue only if these languages are spoken to the child equally often so that the child learns the languages at the same time. Percentages reported are based on "single language responses" to the question "What is the language that this person first learned at home in childhood and still understands?"

Kindergarten (typically 4- and 5-year-olds), elementary (Grades 1 to 8), and secondary (Grades 9 to 12) public education are free to all individuals who qualify as resident students of a school board.[6] Under the Education Act, children must generally attend school from the age of 6 until the age of 18 unless they are excused for a reason set out in the Education Act.[7,8]

While kindergarten is not mandatory, approximately 85% of eligible children are enrolled.[9,10] Ontario has a 2-year full-day kindergarten program that is child centered and developmentally appropriate for 4- and 5-year-olds. The purpose of the program is to establish a strong foundation for learning in the early years in a safe and caring play- and inquiry-based environment that promotes the physical, social, emotional, and cognitive development of all children.

Following kindergarten, there are four divisions within the education system: primary (Grades 1 to 3), junior (Grades 4 to 6), intermediate (Grades 7 to 10), and senior (Grades 11 and 12). Grades 1 to 8 comprise the elementary level where teachers typically teach all subjects, and students receive 1,500 minutes per week of instruction time. While there is no mandated percentage of instruction time for science and technology, there is a requirement of 300 minutes per week for instruction in mathematics in Grades 1 to 8. In addition, Ontario's elementary curriculum includes guidance on instruction time for reading (Grades 1 to 3),[11] Indigenous language programs (where offered),[12] French as a second language (in English-language schools only),[13] and daily physical activity (Grades 1 to 8).[14] Decisions regarding the amount of time spent on other areas of the elementary curriculum are made at the local level to allow educators choice in integrating subject content.

Grades 9 to 12 comprise the secondary level where students earn credits through the successful completion of courses that are a minimum of 110 hours in length.[15] The Grade 9 science and mathematics courses are de-streamed, providing all students with the same learning experience. In Grade 10, there are three course types for science and mathematics: academic, applied, and locally developed. Academic courses develop students' knowledge and skills through the study of theory and abstract problems, focusing on the essential concepts of a subject, exploring related concepts, and incorporating practical applications as appropriate. Applied courses focus on the essential concepts of a subject and develop students' knowledge and skills through practical applications and concrete examples. Locally developed courses may be developed by a board for students in a particular school or region to accommodate education and/or career preparation needs that are not met through courses within the provincial curriculum policy documents.

Students focus their pathways in Grades 11 and 12 according to their intended initial postsecondary destination, whether in apprenticeship training, college, university, or the workplace. Among other requirements to graduate with an Ontario Secondary School Diploma (OSSD), students must earn three compulsory credits in mathematics (with at least one credit taken in Grade 11 or 12) and two compulsory credits in science (with one elective credit in science taken in Grades 11 or 12), technological education, computer studies, cooperative education, or French as a second language. (The elective credit of French as a second language is specific to English-language school boards.)

Based on preliminary 2022–2023 data, about 93% of Ontario's students were enrolled in publicly funded schools.[16] Ontario's school boards operate the province's publicly funded schools. The boards administer the funding they receive from the province for their schools. Ontario's 72 district school boards are made up of 31 English-language public boards, 29 English-language Catholic boards, 4 French-language public boards, and 8 French-language Catholic boards. A distinct feature of the French-language education system is the *Aménagement Linguistique* policy, which is intended to promote, enhance, and expand the use of French language and culture in a minority setting and in all spheres of activity.[17]

A small number of Ontario schools are operated by School Authorities. The School Authorities manage special types of schools, such as schools in hospitals and treatment facilities, or schools in remote and sparsely populated regions. Additionally, there are three Ministry-operated provincial schools that serve students who are Deaf or hard of hearing; one Ministry-operated provincial school that serves students who are blind, low vision, or Deafblind; and three Ministry-operated demonstration schools for students with severe learning disabilities. The French-language provincial school that serves students who are Deaf, hard of hearing, blind, low vision, or Deafblind and the demonstration school that serves students with severe learning disabilities are operated by the Centre Jules-Leger Consortium. The educational programming and variety of specialty programs and services that these schools provide support student success and improved life outcomes for these children and youth.

Using the preliminary 2022–2023 data, the publicly funded education system had more than 2 million students enrolled in approximately 4,000 elementary and 900 secondary schools.[18] About two thirds of Ontario's students were enrolled in public schools and one third in Catholic schools. Approximately 5.5% of Ontario's students were enrolled in French-language schools.[19] There are approximately 85,000 full-time equivalent elementary school teachers and 42,000 full-time equivalent[b] secondary school teachers in Ontario.[20]

There are over 1,300 Ministry-recognized private schools.[21] Private schools do not receive government funding; however, the Ministry inspects all private secondary schools seeking authority to grant credits in courses leading to the OSSD.

Use and Impact of TIMSS

The Ontario Ministry of Education recognizes the importance of being evidence driven and data informed. Ontario has participated as a benchmarking participant in the Grades 4 and 8 assessments for each administration of TIMSS (when administered) since the first cycle in 1995, the exception being TIMSS 2023 when the province participated in the Grade 4 assessments only. Alongside classroom, provincial, national, and other international assessments, TIMSS results have contributed to the Ministry's ongoing effort to improve the Ontario education system in ways that support student learning and achievement. TIMSS achievement and questionnaire results have been used by Ontario policymakers, curriculum specialists, and

b The count of full-time equivalent teachers includes Long-Term Occasional teachers and excludes teachers on leave and teachers in Education and Community Partnership Program facilities.

researchers to better understand the province's math and science achievement over time and relative to international jurisdictions, inform curriculum revisions, and explore strategies that address gaps in student learning. Notably, the recent revision to the Ontario Grade 1–8 Science and Technology Curriculum (2022)/*Le curriculum de l'Ontario— Sciences et Technologie, de la 1re à la 8e année (2022)* and the Grade 9 Science course were informed by TIMSS results along with input from the general public, education stakeholders and partners, national and other international assessment information, and research.

The Mathematics Curriculum in Primary and Lower Secondary Grades

In 2020, the Ministry of Education released the revised *Ontario Curriculum, Grades 1 to 8: Mathematics* and *Le curriculum de l'Ontario—Mathématiques, de la 1re à la 8e année*.[22,23,c] The revised English- and French-language curricula were developed in parallel and are equivalent. The vision of the mathematics curriculum is to help all students develop positive identities as mathematics learners and see themselves as mathematically skilled, to support them as they use mathematics to make sense of the world, and to enable them to make critical decisions based on mathematically sound principles. This vision is attained in a mathematics classroom filled with enthusiasm and excitement—a classroom where all students receive the highest-quality mathematics instruction and learning opportunities, interact as confident mathematics learners, and are thereby enabled to reach their full potential.

The goal of the Ontario elementary mathematics curriculum is to provide all students with the foundational skills required to do the following:

- understand the importance of and appreciate the beauty of mathematics
- recognize and appreciate multiple mathematical perspectives
- make informed decisions and contribute fully to their own lives and to today's competitive global community
- adapt to changes and synthesize new ideas
- work both independently and collaboratively to creatively approach challenges
- communicate effectively
- think critically and creatively and see connections to other disciplines beyond mathematics, such as other science, technology, engineering, and mathematics (STEM) disciplines

The curriculum identifies the math expectations for Grades 1 to 8 and describes the knowledge, concepts, and skills that students are expected to acquire, demonstrate, and apply in their classwork and activities, on tests, in demonstrations, and in various other activities on which their achievement is assessed and evaluated. The fundamental concepts, skills, and processes are introduced in the primary grades and solidified and extended throughout the junior and intermediate grades. The program is continuous as well, from the elementary to

c See https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics for more information.

the secondary level. Teachers connect mathematics to students' everyday experiences, which helps all students develop a deeper understanding of the relevance of mathematics to the world beyond the classroom.

The expectations in the elementary mathematics curriculum are organized into six distinct but related strands or broad areas of learning. The elementary mathematics curriculum includes one process strand, Social-Emotional Learning (SEL) Skills in Mathematics and the Mathematical Processes, and five content strands: Number, Algebra, Data, Spatial Sense, and Financial Literacy.

In all grades of the mathematics program, learning related to the Social-Emotional Learning (SEL) Skills in Mathematics and the Mathematical Processes strand takes place in the context of learning related to the other five strands and is assessed and evaluated within these contexts. This process strand focuses on the development and application of SEL skills while using mathematical processes. These skills support students' understanding of mathematical knowledge, concepts, and skills, and foster their overall well-being and ability to learn while helping them build resilience and thrive as mathematics learners. As they develop SEL skills, students demonstrate a greater ability to understand and apply the mathematical processes that are critical to supporting learning in mathematics: problem-solving; reasoning; and proving, reflecting, connecting, communicating, representing, and selecting tools and strategies.

Fourth-Grade Mathematics Curriculum

The content strands as they relate to fourth-grade mathematics are described below.

- Number—Students work with numbers up to 10,000 and are introduced to decimals. They learn how decimal numbers are used in real life, such as taking a person's temperature on a thermometer and when making and recording precise measurements. Students begin to divide two- and three-digit whole numbers by a one-digit whole number and are expected to know multiplication facts from 1 × 1 to 10 × 10. They also begin to solve problems that require more than one operation with whole numbers.
- Algebra—Students build their knowledge of patterning as they begin to classify patterns as repeating or increasing. They also begin to determine the values that make algebraic statements true, for example, if $n + 3 = 10$, then n must be 7. Students learn to write and read computer code to create geometric designs. They also use the modeling process to analyze and create solutions for real-life situations, such as raising money through a walkathon.
- Data—Students continue learning about data as they collect, organize, and display two or more datasets using frequency tables and multiple-bar graphs. Students begin to learn how to create an infographic so that they can tell a story about data.
- Spatial Sense—Students learn the characteristics and properties of a rectangle, one of the most common shapes in everyday life. Students learn how to determine the

area of a rectangle and the relationship between various units in the metric system, a measurement system used throughout Canada and most of the world.

- Financial Literacy—Students learn that there are different ways to pay for goods and services. Students also learn how consumers determine whether an item is good value for the price.

Eighth-Grade Mathematics Curriculum

The content strands as they relate to eighth-grade mathematics are described below.

- Number—Students use scientific notation, such as 5.46×10^6, to understand, represent, and compare very large and small numbers more easily, which is often required in science. Students use fractions, decimals, and percents interchangeably and should be able to recall square numbers to 144 and their square roots. Students solve problems that involve proportions (for example, determining the percentage increase or decrease in the attendance of a show) and whole numbers, fractions, decimals, integers, and exponents.
- Algebra—Students continue to develop their understanding of patterns, including those that involve integers. They use algebraic notation, such as $s = d/t$, to represent the relationship between speed, distance, and time. They solve algebraic equations involving multiple terms, integers, and decimal numbers. Students write code to create a line or curve that falls between the greatest number of data points. They also use modeling for real-life situations, such as making predictions about future fundraisers based on the funds raised from past fundraisers.
- Data—Students continue to build their data skills. They analyze data that are presented in more complex ways, such as in scatter plots that show the relationship between two variables. In addition, students continue to increase their understanding of probability by comparing the outcomes of more complex experiments.
- Spatial Sense—Students continue to develop spatial sense as they study right-angle triangles. They learn that if two side lengths are known, then the length of the third can be figured out without measuring it using the Pythagorean theorem. Students learn how to calculate unknown angles by applying the angle properties of intersecting and parallel lines. Students also build their understanding of very large units, such as a terabyte, and very small units, like a nanosecond, that are used in current technologies.
- Financial Literacy—Students learn to create a plan to reach financial goals and identify ways to maintain balanced budgets. Students compare different ways that consumers can get value for their money when spending, such as using reward programs or taking advantage of sales. Students investigate the concepts of simple and compound interest using technology (for example, a spreadsheet program) and explain how interest affects long-term financial planning.

The Science Curriculum in Primary and Lower Secondary Grades

In 2022, the Ontario Ministry of Education released the revised *Ontario Curriculum, Grades 1 to 8: Science and Technology* and *Le curriculum de l'Ontario—Sciences et technologie, de la 1re à la 8e année*.[24,25,d] The English- and French-language curricula for science and technology were developed, implemented, and revised in parallel. The elementary science and technology curriculum is consistent with Canada's goals of science education outlined in the Common Framework of Science Learning Outcomes K–12, which aims to develop the scientific literacy of Canadian students.[26]

Ontario's elementary science and technology curriculum provides numerous opportunities for students to develop essential STEM skills while making important connections that allow them to deepen their understanding of the fundamental concepts and big ideas of science and technology. The fundamental concepts in science and technology provide a framework for the acquisition of all scientific and technological knowledge. They also help students to integrate scientific and technological knowledge with knowledge in other subject areas, such as mathematics and social studies.

The curriculum focuses on connecting, developing, reinforcing, and refining the knowledge, concepts, and skills that students acquire as they work toward meeting the overall expectations in the elementary school program. This approach reflects and accommodates the progressive nature of the development of knowledge, concepts, and skills in science and technology learning. Note that *all* the skills specified in the early grades continue to be developed and refined as students move through the grades, whether or not each of those skills continue to be explicitly required in an expectation.

Ontario's elementary science and technology curriculum has three main goals for students:

1. to develop the skills and make the connections needed for scientific and technological investigation
2. to relate science and technology to our changing world, including society, the economy, and the environment
3. to explore and understand science and technology concepts

Ensuring that all students see themselves as confident, effective science and technology learners and practitioners is at the forefront of the program. Students analyze scientific and technological discoveries and innovations made by people with diverse experiences and integrate their own scientific and technological skills and knowledge to enhance their learning in the classroom. Students explore Indigenous knowledge, which can broaden their understanding of and appreciation for Indigenous cultures and practices and provide them with valuable ways in which to investigate how diverse perspectives enrich science and technology practices. Finally, the science and technology curriculum helps students develop important scientific literacy and technological skills that will enable them to thrive in their future professional and

d See https://www.dcp.edu.gov.on.ca/en/curriculum/science-technology for more information.

personal lives and to become discerning, knowledgeable, and active problem-solvers in their communities.

The science and technology curriculum expectations are organized into five distinct but related strands or broad areas of learning: STEM Skills and Connections, Life Systems, Matter and Energy, Structures and Mechanisms, and Earth and Space Systems.

In all grades of the science and technology curriculum, the learning related to the STEM Skills and Connections strand is applied to learning related to the other four areas of the curriculum. The STEM Skills and Connections strand enables students to investigate concepts and integrate knowledge from each of the other strands and make practical connections between science and technology and other subject areas. Students integrate the STEM Skills and Connections expectations with the other strands as they develop their understanding of strand-specific concepts, investigate phenomena, and make meaningful connections to the real world.

Fourth-Grade Science Curriculum

An overview of the content strands as they relate to fourth grade is described below.

- Life Systems—Students continue to develop their understanding of the natural environment as they explore various local habitats, examine the different organisms interacting within them, and describe how communities are formed. Their knowledge and understanding are deepened as they are introduced to the concept of food chains and learn to categorize organisms in the environment according to their diet. They continue to assess the impact of human activities on habitats and communities and explore ways of addressing these.
- Matter and Energy—Students demonstrate their understanding of light and sound as forms of energy that have specific characteristics and properties and assess the impact of technological innovations in light and sound on society and the environment. They also deepen their learning on vibrations as the cause of sound waves and explore how materials interact with light and sound energy.
- Structures and Mechanisms—Students explore the basic principles and functions of machines and their mechanisms and assess their impact on society and the environment. They also continue to develop their learning on how mechanisms transmit and transform various types of motion, and how forces are changed, such as raising a flag with a pulley system or pressing down on a piano key.
- Earth and Space Systems—Students continue their investigation of the natural environment as they are introduced to Earth processes that result in the formation of different types of rocks. They deepen their understanding of rocks and minerals as they engage in classifying them using various tests and criteria. They also look at the importance of rocks and minerals in people's everyday lives and their relationship to the environment.

Eighth-Grade Science Curriculum

An overview of the content strands as they relate to eighth grade is described below.

- Life Systems—Building on the knowledge that the cell is the basic unit of life as part of the introduction to cell theory, students examine the structure and function of plant and animal cells and their components. They investigate simple cell processes and the impact of emergent technologies in the field of cell biology on society and the environment.
- Matter and Energy—Students examine basic fluid mechanics principles and the properties and uses of fluids. They explore how fluid compression affects its use in technological applications and examine the buoyancy of an object in a variety of fluids. They deepen their learning on how forces are transferred in fluids and identify factors affecting the flow of fluids. They also assess the impact of various technologies that rely on the properties of fluids, learn about pneumatic and hydraulic systems, and explore how flow is regulated in mechanical devices and in living systems.
- Structures and Mechanisms—Students explore different types of mechanical systems and the factors that contribute to their safe and efficient operation. They also describe the conditions that are required for work to be done, analyze the mechanical advantage of various systems, and describe technological innovations that make these systems more efficient. They assess personal, social, and environmental impacts of various systems.
- Earth and Space Systems—Students investigate different water systems, such as local watersheds and municipal water management facilities, and learn about sustainability by examining the impact of human activities on natural water systems. They examine factors, including climate change, that have contributed to the melting of glaciers and polar ice caps and describe the effects of this phenomenon on local and global water systems.

Teacher Professional Development Requirements and Programs

The responsibility for providing ongoing professional learning is shared by the Ontario Ministry of Education, the Ontario College of Teachers, teachers' federations, and Ontario school boards. Regulation 304 under the Education Act, "School Year Calendar, Professional Activity Days," sets out the requirements that school boards must follow in planning and developing their school year calendar. Currently, within each school year, school boards must designate a minimum of 3 professional activity (PA) days, the content of which must be consistent with provincial education priorities established by the Minister of Education. School boards may designate up to 4 additional PA days in each school calendar with the authority to determine the content of those days in accordance with local needs and priorities.

In the 4 years leading up to the TIMSS 2023 assessments, the Ministry has supported teacher professional development in mathematics and science in different ways. This includes

ensuring that PA days reflect priority subjects each school year, providing educators with opportunities to partake in Ministry-facilitated training on topics like high-impact instructional practices in mathematics, and understanding the structure and content of the revised elementary science and technology curriculum. The ministry has also developed multimedia resources to support math and science instruction, offers subsidies to existing teachers to complete additional qualification (AQ) courses in math, and provides funding to school boards to hire board- and school-based positions to support educators in improving student math performance. Additionally, teachers may also participate in Teacher Learning and Innovation Allocation, which is a program that supports ongoing teacher professional learning.

Monitoring Student Progress in Mathematics and Science

The Education Quality and Accountability Office (EQAO) is an agency funded by the Ministry that develops and administers annual large-scale, census-based provincial assessments.[e] EQAO administers assessments in mathematics to all students in Grades 3, 6, and 9 in the English and French languages, and the assessments are based on the Ontario curriculum expectations. EQAO also administers provincial assessments in reading, writing, and literacy, with no provincial assessments in science. All assessments include both selected- and open-response questions. Provincial assessment results do not affect student grades or promotion in Grades 3 and 6, while in Grade 9, schools and/or school boards have the option to count the results of the Grade 9 mathematics assessment as a portion of a student's overall course grade (up to 30%).[f] The Ministry uses the results of the provincial mathematics assessments to monitor student performance in math, identify areas of strength and need in mathematics learning as a system, and guide the allocation of system resources. In the 2021–2022 academic year, EQAO offered all its assessments through a digital assessment platform.

The monitoring of student progress in mathematics and science (as well as all subjects) is guided by Ontario's assessment, evaluation, and reporting policy. Released in 2010, the provincial assessment policy covering Grades 1 to 12, *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools*, guides the English-language school system,[27] and *Faire croître le succès: Évaluation et communication du rendement des élèves fréquentant les écoles de l'Ontario (1re-12e année)* guides the French-language system. In 2016, an addendum for kindergarten was released,[28] and in 2020, an addendum for mathematics (Grades 1 to 8) was released.[29,g] Together, these policies provide guidance on assessment, evaluation, and reporting from kindergarten to Grade 12 with the goal of moving the province toward greater consistency in assessment practice and greater levels of fairness, transparency, and equity. These policies were designed to ensure that assessment, evaluation, and reporting are valid and reliable and that they lead to the improvement of learning for all students, help inform instructional decisions,

e See http://www.eqao.com for more information.

f Starting in 2024–2025, the results of the EQAO Grade 9 mathematics assessment are to be included in the final evaluations of the Grade 9 mathematics course for at least 10%, and up to a maximum of 30%, of each student's final course grade.

g See https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-language/context/assessment-evaluation for more information.

and promote student engagement in the assessment process. The policies are rooted in the tenet that educators have a responsibility to develop students' assessment skills, whether in mathematics, science, or any subject, so students can monitor and direct their own learning, set specific goals, and plan next steps for achievement. In the French-language version of the assessment policy, there is an added principle referring to language and culture, encouraging students to use the French language and embrace francophone cultures.

As outlined in the provincial assessment policies, the different purposes and uses of assessment information are emphasized through the processes of assessment *for*, *as*, and *of* learning, which the Ministry considers an integral part of teaching and learning for all subjects, including mathematics and science. To support these processes, educators plan lessons that are responsive to the needs of all students, provide descriptive feedback to learners during the learning process, and explicitly teach students to apply criteria to determine their progress toward learning goals so students can decide where to focus their efforts. Educators consider multiple sources to ensure the validity and reliability of assessments.

Classroom assessment and evaluation are based on the overall expectations of the provincial curriculum. All curricula have achievement charts with four levels of achievement and four categories of knowledge and skills: knowledge and understanding, thinking, application, and communication. The achievement chart is a standard provincewide guide used by teachers to make judgments about student work that are based on clear performance standards and on a body of evidence collected over time.[30] The provincial standard or expected level of achievement is Level 3, the level at which teachers and parents can be confident that students are well prepared for work in the next grade or the next course.

Special Initiatives in Mathematics and Science Education

In the 4 years between the TIMSS 2019 and TIMSS 2023 assessments, the Ontario Ministry of Education supported mathematics and science education in various ways that included launching a 4-year math strategy; updating the elementary mathematics and science and technology curricula, as well as high school courses in STEM; providing online tutoring; and de-streaming Grade 9, among other initiatives. An overview of the Ministry's efforts to support mathematics and science education within this time frame follows.

In August 2019, the Ministry launched a 4-year math strategy to get back to basics and make sure students and educators have the math skills and resources to succeed in the classroom and beyond. The strategy was designed to improve student performance in math, help students solve everyday math problems, and increase students' employability for the jobs of tomorrow. The 4-year math strategy included the following:

- revising the elementary math curriculum in Grades 1 to 8 to enable a strong understanding of the fundamentals of math and how to apply them, accompanied by parent and teacher resources[h]

h See https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics for more information.

- funding school boards to hire board- and school-based positions to support educators in improving student math performance
- providing opportunities for students to receive high-quality math instruction outside the classroom, such as through summer learning programs and online tutoring
- passing legislation that requires new teachers to pass a math proficiency test before they enter the classroom in a professional capacity
- providing subsidies for existing teachers to complete AQ courses in math

The Ontario government is updating high school courses in STEM, including learning related to the skilled trades, to ensure students have the cutting-edge digital literacy and modern technological skills to lead the global economic, scientific, and societal innovations of tomorrow. These changes support the government's plan to align curriculum changes with the province's economic needs and place an emphasis on critical life and job skills needed in the fast-growing skilled trades. The curriculum revisions are also part of the next steps in Ontario's Plan to Catch Up program[i] and ensure students have exposure and access to learning opportunities to consider STEM fields and skilled trades as a future career.

TVO's Mathify provides English-language students enrolled in a publicly funded school with the ability to access one-on-one online math tutoring from Ontario-certified teachers. Mathify services are currently available for students in Grades 4 to 12.[j]

Eurêka! provides online learning supports, including one-on-one tutoring from Ontario-certified teachers, to students in Grades 1 to 12 enrolled in French-language schools and their parents. Specialized supports are offered in mathematics, science, and French for students in Grades 4 to 12. Eurêka! also provides summer learning opportunities through thematic camps that focus on STEM concepts and skills, as well as literacy.[k]

De-streaming Grade 9 is helping to create conditions for all students to be successful, to be prepared for the senior program in secondary school, and to pursue any postsecondary pathway they choose. The de-streamed Grade 9 mathematics course was introduced during the 2021–2022 academic year and is designed to provide an inclusive learning experience for all students to engage with rich complex mathematics. The course represents a major update that reflects emerging job-market needs, emphasizes real-world applications, and responds to key recommendations provided by employers and education experts. The Grade 9 mathematics course builds on learning from the Grade 1 to 8 curriculum that was implemented in September 2020. The course emphasizes foundational mathematical concepts, in addition to other new areas like coding, mathematical modeling, financial literacy, and extending learning in data literacy.

The de-streamed Grade 9 science course was introduced during the 2022–2023 academic year. This course builds on learning from the elementary Grade 1 to 8 science and technology curriculum, providing students with a foundation for learning concepts and skills needed to

i See https://news.ontario.ca/en/release/1002410/province-takes-action-to-ensure-students-catch-up for more information.

j See https://mathify.tvolearn.com/ for more information.

k See https://moneureka.ca/ for more information.

prepare them for the future. New learning includes STEM skills, careers and connections, coding and emerging technologies, and climate change.

In response to the COVID-19 pandemic and as part of Ontario's Plan to Catch Up program, the government invested $175 million to provide funding to school boards for a Tutoring Supports Program that ran from April 1, 2022, to June 30, 2023. During this time, more than 312,000 students in all grades accessed tutoring supports through this funding, including more than 38,000 students with special education needs. School boards reported high levels of success with this initiative, with more than 88% of participating students surveyed showing academic improvement and 90% of participating students surveyed showing an improvement in their engagement, confidence, and attitude.[l]

Since 2010, the Ministry of Education has funded a Summer Learning Program administered by the Council of Directors of Education and delivered by school boards. This program is typically 3 weeks in duration and is focused on ensuring equity of achievement for students in kindergarten to Grade 6. The program supports students to prevent summer learning loss and improve numeracy and literacy skills through free, high-quality instruction and recreational activities during the summer.[m]

Additionally, the Ministry provides funding for summer learning to United for Literacy, a nonprofit Canadian literacy agency that delivers a range of free programs for students and youth in all grades, parents, and community organizers in 11 urban centers and 24 remote Indigenous communities in Ontario. Through Ministry funding, United for Literacy offers Urban Summer Programs for students in low-income and newcomer urban communities, as well as summer literacy programs delivered in partnership with Indigenous communities.

The Learning Opportunities Grant within the Grant for Student Needs provides funding for a range of programs to help students who are at greater risk of poor academic achievement, including the Literacy and Math Outside the School Day Allocation. This allocation provides funding for noncredit courses for students in Grades 7 to 12 for whom remedial courses have been recommended by the principal. The Learning Opportunities Grant also includes the Tutoring Allocation, which provides funding for school boards to offer tutoring to students in all grades who need additional support.

l See https://www.ontario.ca/page/investing-in-students for more information.

m Beginning in summer 2024, the Summer Learning Program will be funded directly to school boards rather than through an agreement with the Council of Directors of Education.

Suggested Reading

For more information in both English and French about Ontario's policies, programs, and initiatives, see the Ontario Ministry of Education's website: http://www.edu.gov.on.ca

References

1 Statistics Canada. (2022). *Table 98-10-0001-01: Population and dwelling counts: Canada, provinces and territories*. Retrieved from https://doi.org/10.25318/9810000101-eng

2 Statistics Canada. (2022). *Table 98-10-0001-01: Population and dwelling counts: Canada, provinces and territories*. Retrieved from https://doi.org/10.25318/9810000101-eng

3 Statistics Canada. (2023). *Census profile, 2021 census of population. Statistics Canada catalogue no. 98-316-X2021001. Ottawa* [table]. Retrieved from https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Ontario&DGUIDlist=2021A000235&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0

4 Statistics Canada. (2023). *Census profile, 2021 census of population. Statistics Canada catalogue no. 98-316-X2021001. Ottawa* [table]. Retrieved from https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Ontario&DGUIDlist=2021A000235&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0

5 Ministry of Education, Ontario. (2014). *Child Care and Early Years Act, 2014, S.O. 2014, c. 11, sched. 1*. Retrieved from https://www.ontario.ca/laws/statute/14c11#BK1

6 Ministry of Education, Ontario. (2016). *Ontario schools: Kindergarten to grade 12 policy and program requirements*. https://files.ontario.ca/edu-ontario-schools-policy-programs-2016-en-2022-01-19.pdf

7 Ministry of Education, Ontario. (1990). *Education Act, R.S.O. - sections 21 and 34*. Retrieved from https://www.ontario.ca/laws/statute/90e02#BK31

8 Ministry of Education, Ontario. (2020). *Ontario Regulation 374/10 supervised alternative learning and other excusals from attendance at school*. Retrieved from https://www.ontario.ca/laws/regulation/100374

9 Ministry of Education, Ontario. (2022–2023 Preliminary). *Ontario School Information System (OnSIS)*. Preliminary as of April 5, 2024, with all schools with completed data submissions.

10 Statistics Canada. (2021). *Table 17-10-0005-01: Population estimates on July 1, by age and gender*. https://doi.org/10.25318/1710000501-eng

11 Ministry of Education, Ontario. (2023). *Policy/program memorandum 168*. Retrieved from https://www.ontario.ca/document/education-ontario-policy-and-program-direction/policyprogram-memorandum-168

12 Ministry of Education, Ontario. (2001). *Native languages*. https://www.edu.gov.on.ca/eng/curriculum/elementary/nativelang18curr.pdf

13 Ministry of Education, Ontario. (2022). *French as a second language programs*. Retrieved from https://www.ontario.ca/page/french-second-language-programs#:~:text=At%20the%20elementary%20level%2C%20students,for%20Grades%2011%20and%2012

[14] Ministry of Education, Ontario. (2017). *Policy/program memorandum 138*. Retrieved from https://www.ontario.ca/document/education-ontario-policy-and-program-direction/policyprogram-memorandum-138

[15] Ministry of Education, Ontario. (2016). *Ontario schools: Kindergarten to grade 12 policy and program requirements*. https://files.ontario.ca/edu-ontario-schools-policy-programs-2016-en-2022-01-19.pdf

[16] Ministry of Education, Ontario. (2022–2023 Preliminary). *Ontario School Information System (OnSIS)*. Preliminary as of May 24, 2024, with all schools with completed data submissions.

[17] Ministry of Education, Ontario. (2004). *Aménagement linguistique policy (PAL)*. Retrieved fromhttps://www.ontario.ca/page/policies-french-language-education#section-0

[18] Ministry of Education, Ontario. (2022–2023 Preliminary). *Ontario School Information System (OnSIS)*. Preliminary as of April 5, 2024, with all schools with completed data submissions.

[19] Statistics Canada. (2021). *Table 17-10-0005-01: Population estimates on July 1, by age and gender*. https://doi.org/10.25318/1710000501-eng

[20] Ministry of Education, Ontario. (2022–2023 Preliminary). *Ontario School Information System (OnSIS)*. Preliminary as of April 5, 2024, with all schools with completed data submissions.

[21] Ministry of Education, Ontario. (2021–2022 Preliminary). *Ontario School Information System (OnSIS)*. Preliminary as of February 2, 2024, with all schools with completed data submissions.

[22] Ministry of Education, Ontario. (2020). *The Ontario curriculum, grades 1–8: Mathematics*. Retrieved from http://www.edu.gov.on.ca/eng/curriculum/elementary/math.html

[23] Ministry of Education, Ontario. (2020). *Le curriculum de l'Ontario de la 1re à la 8e année*. Retrieved from http://www.edu.gov.on.ca/fre/curriculum/elementary/math.html

[24] Council of Ministers of Education, Canada. (1997). *Common framework of science learning outcomes K–12*. Retrieved from http://science.cmec.ca/index.en.htm

[25] Ministry of Education, Ontario. (2022). *Le curriculum de l'Ontario de la 1re à 8e année: Sciences et technologie*. Retrieved from https://www.dcp.edu.gov.on.ca/en/curriculum/science-technology

[26] Ministry of Education, Ontario. (2022). *Le curriculum de l'Ontario de la 1re à 8e année: Sciences et technologie*. Retrieved from https://www.dcp.edu.gov.on.ca/fr/curriculum/sciences-technologie

[27] Ministry of Education, Ontario. (2010). *Growing success: Assessment, evaluation, and reporting in Ontario schools*. www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf

[28] Ministry of Education, Ontario. (2016). *Growing success: The kindergarten addendum. Assessment, evaluation, and reporting in Ontario schools*. https://www.edu.gov.on.ca/eng/policyfunding/GSKindergartenAddendum2018.pdf

[29] Ministry of Education, Ontario. (2020). *Growing success: Assessment, evaluation, and reporting in Ontario schools, kindergarten to grade 12. Mathematics addendum (grades 1 to 8)*. Retrieved from https://www.ontario.ca/page/growing-success-assessment-evaluation-and-reporting-ontario-schools-kindergarten-grade-12

[30] Ministry of Education, Ontario. (2004). *The Ontario curriculum, grades 1–12: Sample achievement charts*. Retrieved from https://www.dcp.edu.gov.on.ca/en/assessment-evaluation/sample-achievement-charts