Ontario eSecondary School
Course Outline
2024-2025

Ministry of Education Course Title: Grade 9 De-streamed Mathematics	
Ministry Course Code: MTH1W	
Course Type: Grade 9 Mathematics	
Grade: 9	
Credit Value: 1.0	
Prerequisite(s): None	
Department: Mathematics	
Course developed by: Andrew Lee	**Date created:** Aug 31, 2021
Length: One Semester	**Hours:** 110
This course has been developed based on the following Ministry documents: 1. *The Ontario Curriculum, Gr 9 Destreamed Mathematics 2021* 2. *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools (2010)* 3. *Learning for All (2013)*	

COURSE DESCRIPTION/RATIONALE

This course enables students to consolidate, and continue to develop, an understanding of mathematical concepts related to number sense and operations, algebra, measurement, geometry, data, probability, and financial literacy. Students will use mathematical processes, mathematical modelling, and coding to make sense of the mathematics they are learning and to apply their understanding to culturally responsive and relevant real-world situations. Students will continue to enhance their mathematical reasoning skills, including proportional reasoning, spatial reasoning, and algebraic reasoning, as they solve problems and communicate their thinking.

http://www.edu.gov.on.ca/eng/curriculum/secondary/math1112currb.pdf

OVERALL CURRICULUM EXPECTATIONS

Social-Emotional Learning (SEL) Skills in Mathematics	Develop and explore a variety of social-emotional learning skills in a context that supports and reflects this learning in connection with the expectations across all other strands.
Mathematical Thinking and Making Connections	Apply the mathematical processes to develop a conceptual understanding of, and procedural fluency with, the mathematics they are learning. Make connections between mathematics and various knowledge systems, their lived experiences, and various real-life applications of mathematics, including careers.
Number	Demonstrate an understanding of the development and use of numbers, and make connections between sets of numbers. Represent numbers in various ways, evaluate powers, and simplify expressions by using the relationships between powers and their exponents. Apply an understanding of rational numbers, ratios, rates, percentages, and proportions, in various mathematical contexts, and to solve problems.
Algebra	Demonstrate an understanding of the development and use of algebraic concepts and of their connection to numbers, using various tools and representations. Apply coding skills to represent mathematical concepts and relationships dynamically, and to solve problems, in algebra and across the other strands. Represent and compare linear and non-linear relations that model real-life situations, and use these representations to make predictions.
Data	Describe the collection and use of data, and represent and analyse data involving one and two variables. Apply the process of mathematical modelling, using data and mathematical concepts from other strands, to represent, analyse, make predictions, and provide insight into real-life situations.
Geometry and Measurement	Demonstrate an understanding of the development and use of geometric and measurement relationships, and apply these relationships to solve problems, including problems involving real-life situations.
Financial Literacy	Demonstrate the knowledge and skills needed to make informed financial decisions.

COURSE CONTENT

Unit	*Length*
1: Integers, Rationals, and Powers	19 hours
2: Polynomials and Solving Equations	17.5 hours
3: Linear Relations Part 1	17.5 hours
4: Linear Relations Part 2	17.5 hours
5: Understanding Graphs and Financial Literacy	16 hours
6: Measurement and Geometry	17.5 hours
Final Exam & Culminating Activity	5 hours
Total	**110 Hours**

UNIT DESCRIPTIONS

Unit 1 - Integers, Rationals, and Powers
In this unit, students will continue to make connections among various number systems, the cultural development of number concepts, and real-life applications. They will extend their learning about positive fractions, positive decimal numbers, and integers to work with negative fractions and negative decimal numbers. Students also extend their knowledge and skills related to percentages, ratios, rates, and proportions to make further connections to real life.

Unit 2 - Polynomials and Solving Equations
In this unit, students continue to develop an understanding of algebra by making connections between algebra and numbers as they generalize relationships with algebraic expressions and equations. Students will extend and apply coding skills to dynamically represent situations, analyse mathematics concepts, and solve problems in various contexts. Students will be introduced to various representations of linear and non-linear relations that they will study in more depth in future secondary mathematics courses. Students develop an understanding of the constant rate of change and initial values of linear relations and solve related real-life problems.

Unit 3 – Linear Relations Part 1
Throughout the course, students apply the mathematical processes to develop conceptual understanding and procedural fluency while they engage in learning related to strands B through F. They also make connections between the mathematics they are learning and their lived experiences, various knowledge systems, and real-life applications, including employment and careers.

Unit 4 – Linear Relations Part 2
Students extend their data literacy skills to examine the collection, representation, and use of data, as well as their implications in various contexts. Students consolidate and extend their understanding of data involving one and two variables and its connections to real life. Using data, students continue to apply the process of mathematical modeling to analyse real-life situations.

Unit 5 – Understanding Graphs and Financial Literacy
In this strand, students analyse financial situations to explain how mathematics can be used to understand such situations and inform financial decisions. They extend their financial literacy knowledge to answer questions related to appreciation and depreciation and explain how budgets can be modified based on changes in circumstances. Students compare the effects of different interest rates, down payments, and other factors associated with purchasing goods and services. Students use their learning from other strands to solve financial problems of interest.

Unit 6 - Measurement and Geometry
In this unit, students make connections among various geometric properties and their real-life applications. Students analyse and create designs to extend their understanding of geometric relationships to include circle and triangle properties. Students solve problems using different units within and between various measurement systems, examine the relationships between the volume of cones and cylinders and of pyramids and prisms, and solve problems that apply perimeter, area, surface area, and volume.

TEACHING AND LEARNING STRATEGIES

In this course, students will experience the following activities.

Presentations with embedded videos are utilized to outline concepts, explain theory with the use of examples and practice questions, and incorporate multi-media opportunities for students to learn more (e.g. online simulations, quizzes, etc.).

End of unit conversations and Poodlls are opportunities for students to express their ideas, problem solving, and thought processes with a teacher who provides timely feedback.

Reflection is an opportunity for students to look back at concepts and theories with new eyes, to relate theory to practice, and to align learning with their own values and beliefs.

Discussions with the instructor are facilitated through video conferencing, discussing the concepts and skills being studied. This enables two-way communication between the student and the instructor, to share ideas and ask questions in dialogue. This also helps to build a relationship between the student and instructor.

Instructor demonstrations (research skills, etc.) are opportunities for the instructor to lead a student through a concept or skill through video conferencing, videos, or emailing with the student.

Discussion forums are an opportunity for students to summarize and share their ideas and perspectives with their peers, which deepens understanding through expression. It also provides an opportunity for peer-to-peer feedback.

Practical extension and application of knowledge are integrated throughout the course. The goal is to help students make connections between what they learn in the classroom and how they understand and relate to the world around them and their own lives. Learning becomes a dynamic opportunity for students to be more aware that their learning is all around them and enable them to create more meaning in their lives.

Individual activities/assignments assessments are completed individually at a student's own pace and are intended to expand and consolidate the learning in each lesson. Individual activities allow the teacher to accommodate interests and needs and to assess the progress of individual students. For this reason, students are encouraged to discuss IEPs (Individual Education Plans) with their teacher and to ask to modify assessments if they have a unique interest that they feel could be pursued in the assessment. The teacher plays an important role in supporting these activities by providing ongoing feedback to students, both orally and in writing.

Research is an opportunity to apply inquiry skills to a practical problem or question. Students perform research to gather information, evaluate quality sources, analyze findings, evaluate their analysis, and synthesize their findings into conclusions. Throughout, students apply both creative thinking and critical thinking. New questions are also developed to further learning.

Writing as a learning tool helps students to think critically about course material while grasping, organizing, and integrating prior knowledge with new concepts. Good communication skills are important both in and out of the classroom.

Virtual simulations are interactive websites that provide students with an opportunity to ask questions, relate variables, and examine relationships.

Diagrams are visual representations of mathematical ideas and concepts. They provide another perspective to organize ideas. Visuals are thought to promote cognitive plasticity - meaning, they can help us change our minds or help us to remember an idea.

Graphs and charts are visual representations of math concepts and analysis. This helps us to see the relationships within and between sets of data.

Tables involve organizing information in terms of categories (rows and columns). This helps us to understand the relationships between ideas and data, as well as highlight trends.

Practice problems provide students with a scenario/problem to solve by applying concepts and skills learned in a context. This helps students to understand the relevance of their learning.

ASSESSMENT, EVALUATION, AND REPORTING

Assessment: The process of gathering information that accurately reflects how well a student is achieving the identified curriculum expectations. Teachers provide students with descriptive feedback that guides their efforts towards improved performance.

Evaluation: Assessment of Learning focuses on Evaluation which is the process of making a judgement about the quality of student work on the basis of established criteria over a limited, reasonable period of time.

Reporting: Involves communicating student achievement of the curriculum expectations and Learning Skills and Work Habits in the form of marks and comments determined by the teacher's professional judgement.

STRATEGIES FOR ASSESSMENT

Assessment practices can nurture students' sense of progress and competency and information instruction. Many diagnostic tools, e.g. checklists and inventories, are used at regular intervals throughout the units to encourage students' understanding of their current status as learners and to provide frequent and timely reviews of their progress. Assessment of student acquisition of listening and talking, reading and viewing and writing skills also occurs regularly through unobtrusive teacher observation and conferencing.

Units conclude with performance tasks. Teachers are encouraged to share goals with students early in the course and to connect unit learning experiences frequently and explicitly with big ideas, overall expectations, and performance tasks. The teacher could involve students in the discussion or creation of rubrics, and teach students to use rubrics as a learning tool.

ASSESSMENT ACTIVITIES

- ❑ Homework assignments
- ❑ Individual conference meetings
- ❑ Discussion Forums
- ❑ Diagnostic tests and writing tasks
- ❑ Editing Checklists
- ❑ Reflections
- ❑ Oral presentations & Active Listening
- ❑ Tests & Exam

- ❑ Evaluations
- ❑ Labs and interactive diagrams

EVALUATION

The final grade will be determined as follows:

- ❑ Seventy per cent of the grade will be based on evaluation conducted throughout the course. This portion of the grade should reflect the student's most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement.
- ❑ Thirty percent of the grade will be based on final evaluations administered at or towards the end of the course. This evaluation will be based on evidence from one or a combination of the following: an examination, a performance, an essay, and/or another method of evaluation suitable to the course content. The final evaluation allows the student an opportunity to demonstrate comprehensive achievement of the overall expectations for the course.

  (*Growing Success: Assessment, Evaluation and Reporting in Ontario Schools*. Ontario Ministry of Education Publication, 2010 p.41)

Weightings	
Course Work	**70**
Knowledge/Understanding (K)	17.5
Thinking/Inquiry (T)	17.5
Communication (C)	17.5
Application (A)	17.5
Final Evaluation	**30**
Culminating Activity (2.5K, 2.5T, 2.5C, 2.5A)	10
Final Exam (7.2K, 2.8T, 3.2C, 6.8A)	20

TERM WORK EVALUATIONS (70%):

Evaluation Item	Description	Category	Weight
Unit 1: Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A	11.5
Unit 1: Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A	
Unit 1 End of Unit Conversation	Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit.	K,T,C,A	
Unit 2: Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A	11.5
Unit 2: Unit Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A	
Unit 2 End of Unit Conversation	Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit.	K,T,C,A	
Unit 3: Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A	11.5
Unit 3: Unit Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A	
Unit 3 End of Unit Conversation	Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit.	K,T,C,A	
Unit 4: Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A	11.5
Unit 4: Unit Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A	
Unit 4 End of Unit Conversation	Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit.	K,T,C,A	
Unit 5: Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A	12
Unit 5: Unit Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A	
Unit 5 End of Unit Conversation	Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit.	K,T,C,A	
Unit 6: Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A	12
Unit 6: Unit Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A	

Unit 6 End of Unit Conversation	Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit.	K,T,C,A	

FINAL EVALUATIONS (30%):

Evaluation Item	Description	Category	Weight
Culminating Activity	A final project, covering all curriculum expectations for the course.	K,T,C,A	10
Final Exam	A final, written examination, covering all curriculum expectations for the course.	K,T,C,A	20

AFL/AAL/AOL Tracking Sheet

Unit 1: Integers, Rationals, and Powers

AAL	AFL	AOL
-Handout Solutions	-Lesson Notes -Discussion Forum Post	-Quiz -Unit Assignment -End of unit discussion

Unit 2: Polynomials and Solving Equations

AAL	AFL	AOL
-Handout Solutions	-Lesson Notes -Discussion Forum Post	-Quiz -Unit Assignment -End of unit discussion

Unit 3: Linear Relations Part 1

AAL	AFL	AOL
-Handout Solutions	-Lesson Notes -Discussion Forum Post	-Quiz -Unit Assignment -End of unit discussion

Unit 4: Linear Relations Part 2

AAL	AFL	AOL
-Handout Solutions	-Lesson Notes -Discussion Forum Post	-Quiz -Unit Assignment -End of unit discussion

Unit 5: Understanding Graphs and Financial Literacy

AAL	AFL	AOL
-Handout Solutions	-Lesson Notes -Discussion Forum Post	-Quiz -Unit Assignment -End of unit discussion

Unit 6: Measurement and Geometry

AAL	AFL	AOL
-Handout Solutions	-Lesson Notes -Discussion Forum Post	-Quiz -Unit Assignment -End of unit discussion

Unit 7: Final Assessments

AOL
-Culminating Activity -Final Exam

CONSIDERATION FOR PROGRAM PLANNING

PLANNING PROGRAMS FOR STUDENTS WITH SPECIAL EDUCATION NEEDS

Classroom teachers are the key educators of students who have special education needs. They have a responsibility to help all students learn, and they work collaboratively with special education teachers, where appropriate, to achieve this goal. Special Education Transformation: The Report of the Co-Chairs with the Recommendations of the Working Table on Special Education, 2006 endorses a set of beliefs that should guide program planning for students with special education needs in all disciplines. Those beliefs are as follows: All students can succeed. Universal design and differentiated instruction are effective and interconnected means of meeting the learning or productivity needs of any group of students. Successful instructional practices are founded on evidence-based research, tempered by experience.

PROGRAM CONSIDERATIONS FOR ENGLISH LANGUAGE LEARNERS

Ontario schools have some of the most multilingual student populations in the world. The first language of approximately 20 percent of the students in Ontario's English language schools is a language other than English. Ontario's linguistic heritage includes several Aboriginal languages; many African, Asian, and European languages; and some varieties of English, such as Jamaican Creole. Many English language learners were born in Canada and raised in families and communities in which languages other than English were spoken, or in which the variety of English spoken differed significantly from the English of Ontario classrooms. Other English language learners arrive in Ontario as newcomers from other countries; they may have experience of highly sophisticated educational systems, or they may have come from regions where access to formal schooling was limited. When they start school in Ontario, many of these students are entering a new linguistic and cultural environment.

THE ROLE OF TECHNOLOGY IN THE PROGRAM

Information and communications technologies (ICT) provide a range of tools that can significantly extend and enrich teachers' instructional strategies and support students' language learning. ICT tools include multimedia resources, databases, Internet websites, digital cameras, and word-processing programs. Tools such as these can help students to collect, organize, and sort the data they gather and to write, edit, and present reports on their findings. Information and communications technologies can also be used to connect students to other schools, at home and abroad, and to bring the global community into the local classroom. Whenever appropriate, therefore, students should be encouraged to use ICT to support and communicate their learning.

ACCOMMODATIONS

Accommodations will be based on meeting with parents, teachers, administration and external educational assessment reports. The following three types of accommodations may be provided:

- ***Instructional accommodations:*** such as changes in teaching strategies, including styles of presentation, methods of organization, or use of technology and multimedia.
- ***Assessment accommodations:*** such as allowing additional time to complete tests or assignments or permitting oral responses to test questions.

Other examples of modifications and aids, which may be used in this course, are:

- Provide step-by-step instructions.

- ❑ Help students create organizers for planning writing tasks.
- ❑ Allow students to report verbally to a scribe (teacher/ student) who can help in note taking.
- ❑ Permit students a range of options for reading and writing tasks.
- ❑ Where an activity requires reading, provide it in advance.
- ❑ Provide opportunities for enrichment.