



## Ontario eSecondary School Course Outline 2022-2023

<b>Ministry of Education Course Title:</b> Grade 9 De-streamed Mathematics	
<b>Ministry Course Code:</b> MTH1W	
<b>Course Type:</b> Grade 9 Mathematics	
<b>Grade:</b> 9	
<b>Credit Value:</b> 1.0	
<b>Prerequisite(s):</b> None	
<b>Department:</b> Mathematics	
<b>Course developed by:</b> Andrew Lee	<b>Date created:</b> Aug 31, 2021
<b>Length:</b> One Semester	<b>Hours:</b> 110
This course has been developed based on the following Ministry documents: <ol style="list-style-type: none"> <li>1. <i>The Ontario Curriculum, Gr 9 Destreamed Mathematics 2021</i></li> <li>2. <i>Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools (2010)</i></li> </ol>	

## 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

<b>Social-Emotional Learning (SEL) Skills in Mathematics</b>	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.
<b>Mathematical Thinking and Making Connections</b>	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.
<b>Number</b>	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.
<b>Algebra</b>	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.
<b>Data</b>	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.
<b>Geometry and Measurement</b>	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.
<b>Financial Literacy</b>	Demonstrate the knowledge and skills needed to make informed financial decisions.

## COURSE CONTENT

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

## 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 involve the application of perimeter, area, surface area, and volume.

## **TEACHING AND LEARNING STRATEGIES**

**The students will experience a variety of activities:**

### **Whole-Class Activities (facilitated through discussion forums)**

Whole class activities are designed to introduce concepts and skills that are directly applicable to the workplace and to build on the content being studied during small group and individual activities.

These activities include the following:

**Class discussions** that are facilitated through video conferencing and telephone conversations with their subject teacher or discussions with other students concerning the concepts and skills being studied.

**Video presentations** and technological aids (research) with videos embedded to enrich the course content and clarify concepts and skills being studied. Also the use of online pre-approved quizzes and games to help a student become more familiar with the concepts and skills being studied.

**Diagnostic and review activities** (audio and video taping) can be student-lead or teacher lead to work as a review for students through audio and video made to share among each other to help reinforce the concepts and skills being studied.

**Brainstorming, charts and graphs** are a great way for students to demonstrate their knowledge of subject matter through graphic organizers, pictures, and texts. This is communicated through assignments in Moodle.

### **Individual Activities**

The teacher should provide a variety of individual assignments to expand and consolidate the learning that takes place in the whole-class and small group activities. Individual activities allow the teacher to accommodate interests and needs and to assess the progress of individual students. The teacher plays an important role in supporting these activities through the provision of ongoing feedback to the students, both orally and in writing. Teachers are encouraged to include individual activities such as the following in the course:

**Research** is completed in an online environment by teaching the students first about plagiarism rules and giving examples of good sources to use. The students are not only limited to the online search for information, but have resources available by links on the Moodle page of information that has been scanned and uploaded.

**Individual assignments** are worked on at a student's own pace. The teacher can support the student in these activities with ongoing feedback.

**Oral presentations** are facilitated through the use of video conferencing and video recording.

**Practical extension and application of knowledge** helps students develop their own voice, and gives them the ability to make personal connections, and connections to the world throughout their course. Students are given a variety of reading and viewing texts to give them many chances to apply their new concepts, skills, and knowledge.

**Ongoing project work** is something that is valued in the earning of an English credit. The ongoing project can be submitted to the teacher for ongoing feedback in both written and oral work.

**Reading** students are able to read material online. The students may print out the reading material to use it to highlight, take notes, and have with them when a computer is not available.

**Written assignments** are used to allow students to develop their skills in writing, comprehension, and communication. With the online format students submit their work, and have a chance to get feedback from the teacher, and submit their best work. This can be demonstrated with reading responses, personal writing, report writing, essay writing, script writing, business and technical writing, and individual research assignments.

## 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 as determined by the teacher's use of 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, i.e. check bricks; teacher-adapted generic rubrics available in many sources, including the *Ontario Secondary School Literacy Course (OSSLC) Profile*, so that they are more task-specific. The teacher might ask: "What does the criteria look like for this particular task?" Or "What does limited effectiveness look like?" The teacher could involve students in the discussion or creation of rubrics, and teach students to use rubrics as a learning tool that can support the writing process and practice.

## 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 per cent of the grade will be based on a 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)

<b>Weightings</b>	
<b>Course Work</b>	<b>70</b>
Knowledge/Understanding	17.5
Thinking/Inquiry	17.5
Communication	17.5
Application	17.5
<b>Final Evaluation</b>	<b>30</b>
Culminating Activity	10
Final Exam	20

## TERM WORK EVALUATIONS (70%):

Evaluation Item	Description	Category
Problem sets	Problem sets supplement lessons and are used to assess whether or not students are meeting criteria for success	K,T,C,A
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 Quiz	Each unit has a short quiz on material covered up to the quiz.	K,T,C,A
Unit Assignment	Unit assignments are based on curriculum expectations and cover the entirety of each unit	K,T,C,A

## FINAL EVALUATIONS (30%):

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

## 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
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## CONSIDERATION FOR PROGRAM PLANNING

Students learn best when they are engaged in a variety of ways of learning. Guidance and career education courses lend themselves to a wide range of approaches in that they require students to research, think critically, work cooperatively, discuss relevant issues, and learn through practice in a variety of settings. Helping students become self-directed, lifelong learners is a fundamental aim of the guidance and career education curriculum. When students are engaged in active and experiential learning strategies, they tend to retain knowledge for longer periods and develop meaningful skills. Active and experiential learning strategies also enable students to apply their knowledge and skills to real-life issues and situations.

### ANTIDISCRIMINATION EDUCATION IN GUIDANCE AND CAREER EDUCATION

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 per cent 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 ENGLISH 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 parent, teachers, administration and external educational assessment report. 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.
- Environmental accommodations:** such as preferential seating or special lighting.



- 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.
- Record key words on the board or overhead when students are expected to make their own notes.
- 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.