



GEORGE S. HENRY ACADEMY COURSE OUTLINE

Grade 9 De-Streamed Mathematics 2022



COURSE NAME	Grade 9 Mathematics	GRADE	9
COURSE CODE	MTH1W	CREDIT VALUE	1
Ministry Website	www.edu.gov.on.ca/eng/curriculum/secondary/math910curr.pdf	DEPARTMENT	Mathematics
PREREQUISITE	Grade 8 Mathematics		

COURSE DESCRIPTION

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 throughout the course.

Ministry Learning Expectations

AA. 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

A. 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

B. 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

C. Algebra

- demonstrate an understanding of the development and use of algebraic concepts and of their connection to numbers, using various tools and representation
- 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
- demonstrate an understanding of the characteristics of various representations of linear and non-linear relations, using tools, including coding when appropriate

D. Data

- describe the collection and use of data, and represent and analyze data involving one and two variables
- apply the [process of mathematical modelling](#), using data and mathematical concepts from other strands, to represent, analyze, make predictions, and provide insight into real-life situations

E. 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

F. Financial Literacy

- demonstrate the knowledge and skills needed to make informed financial decisions

Assessment and Evaluation

The primary purpose of assessment and evaluation is to improve student learning. **The Achievement Chart** for *Mathematics* will guide all assessment and evaluation.

The **final grade** will be determined as follows:

70% based on Assessment OF Learning (**including conversations, observations and products**) conducted throughout the course

Knowledge and Understanding.....	20%
Application.....	20%
Thinking.....	15%
Communication.....	15%

30% based on a *Culminating Activity and a Final Exam* administered at or towards the end of the course. The EQAO, will count as 5% of students' final exam.

Final Examination.....	20%*
Culminating Activity.....	10%*

Assessment and evaluation is divided into two important parts. The **grade** the student receives on a mid-term or final report indicates achievement/ proficiency in Curriculum Expectations. A **level of competence** (*Needs Improvement, Satisfactory, Good or Excellent*) will be assessed and reported in the area of **Learning Skills and Work Habits**: Independent Work, Collaboration, Responsibility, Initiative, Self-Regulation, and Organization.

STUDENT RESPONSIBILITIES

It is your responsibility to complete all **assessments of learning** (such as assignments, tests, performance tasks, etc.) as indicated in the Ministry of Education's "Growing Success" document. Any **assessment of learning** that is missed must be justified by a parent phone call on the day of the assessment or a parent note on the first day back. The note must clearly state that you were physically too ill to write an assessment during the math class period on the specific day. You are expected to complete the missed assessment the day you return to school. If you know ahead of time that you will be absent for an assessment, please make arrangements with your teacher to complete the assessment at a mutually convenient time.

You will be given **homework** on a regular basis and are expected to complete it. If you are having trouble with the homework or with the concepts covered in class, be sure to make an appointment to **seek extra help** from your teacher. It is extremely important that you keep up with the work and be present for class. If you are absent, it is your responsibility to get the **notes, assignments and any other missed work** from a classmate. If assigned a textbook, you are responsible for the **textbook** you have signed out. It is important that you note the textbook number and write your name inside the cover (in ink) for ease of identification. You will be expected to pay for lost or damaged textbooks, including books that have been written in.

All **take home assessments** are due at the beginning of the period, unless otherwise stated. If you are late in handing in your assignment, it is your responsibility to see your teacher to explain why the assessment is late and to possibly discuss a final deadline by which the assessment may be submitted. No assignments will be accepted once this negotiated deadline has passed.

Although work and study habits (such as lateness & organization), independence, participation and teamwork are not included in the evaluation scheme (these habits are now reported separately on the report card, as *'needs improvement', 'satisfactory', 'good' or 'excellent'*), it is expected that you will attend regularly, participate actively, and co-operate on group activities. Where group work is performed, the teacher will award marks based on individual achievement (no group marks).

You are expected to put forth a conscientious effort in all assessments, even though they may not count towards your final grade. Once feedback has been given on your understanding of the concepts, it is your responsibility to act on the recommendations to ensure that you will successfully meet the expectations of the unit.

COURSE CONTENT BY UNIT

Unit 1: Number Sets & Rational Numbers

In this unit, students will learn

- how various subsets of a number system are defined and describe similarities and differences between number sets
- to use patterns and number relationships to explain concepts such as density, infinity, and limit as they relate to number sets
- to apply an understanding of integers to describe location, direction, amount, and changes in any of these, in various contexts
- to apply an understanding of unit fractions and their relationship to other fractional amounts
- to apply an understanding of integers to explain the effects that positive and negative signs have on the values of ratios, rates, fractions, and decimals, in various contexts
- to solve problems involving operations with positive and negative fractions and mixed numbers, including problems involving formulas, measurements, and linear relations
- to read/use/create code to represent and solve mathematical situations and problems

Unit 2: Powers

In this unit, students will learn

- the relationship between the sign and size of an exponent and the value of a power
- to evaluate powers
- the relationships between the exponents of powers (i.e. positive, zero and negative exponents)
- the patterning the operations (i.e. exponent rules) with powers.
- to use power relationships to simplify numeric and algebraic expressions with positive, negative and zero exponents.
- to read/use/create code to represent and solve mathematical situations and problems

Unit 3: Polynomials & Equations

In this unit, students will learn

- to simplify algebraic expressions by applying properties of operations of numbers, using various representations and tools, in different contexts (e.g. simplify, expand, substitute and evaluate)
- to use equations to solve problem.
- to create and solve equations for various contexts, and verify their solutions
- to read/use/create code to represent and solve mathematical situations and problems

Unit 4: Linear Relations

In this unit, students will learn

- to represent linear relations using concrete materials, tables of values, graphs, and equations, and make connections between the various representations to demonstrate an understanding of rates of change and initial values
- to compare the shapes of graphs of linear and non-linear relations to describe their rates of change (e.g. constant vs changing, positive vs negative)
- to compare the shapes of graphs of linear and non-linear relations to make connections to growing and shrinking patterns
- to use the shapes of graphs of linear and non-linear relations to make predictions
- to determine the equations of lines from graphs, tables of values, and concrete representations of linear relations by making connections between rates of change and slopes, and between initial values and y-intercepts
- to compare two linear relations of the form $y = ax + b$ graphically and algebraically, and interpret the meaning of their point of intersection in terms of a given context
- to create and solve linear equations for various contexts, and verify their solutions
- to use equations of lines to solve problems
- to read/use/create code to represent and solve mathematical situations and problems

Unit 5: Data & Relationships

In this unit, students will learn

- to identify a current context involving a large amount of data, and describe potential implications and consequences of its collection, storage, representation, and use
- represent and statistically analyze data from a real-life situation involving a single variable in various ways, including the use of quartile values and box plots
- create a scatter plot to represent the relationship between two variables
- to determine the correlation between two variables by testing different regression models using technologies
- to use regression models to make predictions when appropriate
- to read/use/create code to represent and solve mathematical situations and problems

Unit 6: Geometry & Measurement

In this unit, students will learn

- to create and analyze designs involving geometric relationships and circle and triangle properties
- to solve problems involving the side-length relationship for right triangles in real-life situations, including problems that involve composite shapes
- how changing one or more dimensions of a two-dimensional shape and a three-dimensional object affects perimeter/circumference, area, surface area, and volume, using technology when appropriate
- to solve problems involving different units within a measurement system and between measurement systems

Unit 6: Geometry & Measurement_Cont.

- to solve problems using the relationships between the volume of prisms and pyramids and between the volume of cylinders and cones, involving various units of measure
- to read/use/create code to represent and solve mathematical situations and problems

Unit 7: Financial Literacy

In this unit, students will learn

- to identify a past or current financial situation and explain how it can inform financial decisions
- to identify financial situations that involve appreciation and depreciation, and use associated graphs to answer related questions
- to compare the effects that different interest rates, lengths of borrowing time, ways in which interest is calculated, and amounts of down payments have on the overall costs associated with purchasing goods or services, using appropriate tools
- to modify budgets displayed in various ways to reflect specific changes in circumstances, and provide a rationale for the modifications
- to read/use/create code to represent and solve mathematical situations and problems

Final Culminating Tasks

- EQAO
 - All or a portion of the EQAO assessment will be assessed.
- Final Exam
 - Students will be issued an exam which will assess their knowledge in all units of the course. The exam will be 1.5 hours long.
 - The Culminating Activity will be assessed upon completion.

Considerations for Program Planning

Assessment, instructional and environmental **accommodations** are provided to individual students as per their **IEP**. Similarly, **adaptations** for **English Language Learners** are provided based upon the student’s level of language development, strengths, and needs.

STUDENT SIGNATURE

PARENT SIGNATURE