

Forest Hill Collegiate Institute
Course of Study and Evaluation Statement

Grade 9 Mathematics: Academic

Note 1: All Ontario Ministry of Education curriculum documents with full course content information can be located at <http://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.html>

Note 2: Detailed information on Ministry of Education assessment, evaluation, and reporting policy is provided in *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools, 2010*, located at <http://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf>

1. Course Details

- Program Area: **Mathematics**
- Course title: **Principles of Mathematics, Grade 9, Academic (MPM1D). Credit Value 1.0**
- Prerequisites: None
- Textbook that is essential to the course: **Principles of Mathematics 9, Nelson**

2. Overall Goals

- Course Description:

This course enables students to develop generalizations of mathematical ideas and methods through the exploration of applications, the effective use of technology, and abstract reasoning. Students will investigate relationships to develop equations of straight lines in analytic geometry, explore relationships between volume and surface area of objects in measurement, and apply extended algebraic skills in problem solving. Students will engage in abstract extensions of core learning that will deepen their mathematical knowledge and enrich their understanding.
 - Overall Expectations are in the areas of Number Sense and Algebra; Linear Relations; Analytic Geometry; and Measurement and Geometry. By the end of the course, students will:
 - in **Number Sense and Algebra**:
 - * demonstrate an understanding of the exponent rules of multiplication and division, and apply them to simplify expressions;
 - * manipulate numerical and polynomial expressions, and solve first-degree equations.
 - in **Linear Relations**:
 - * apply data-management techniques to investigate relationships between two variables;
 - * demonstrate an understanding of the characteristics of a linear relation;
 - * connect various representations of a linear relation.
 - in **Analytic Geometry**
 - * determine the relationship between the form of an equation and the shape of its graph with respect to linearity and non-linearity;
 - * determine, through investigation, the properties of the slope and y-intercept of a linear relation;
 - * solve problems involving linear relations.
 - in **Measurement and Geometry**
 - * determine, through investigation, the optimal values of various measurements;
 - * solve problems involving the measurements of two-dimensional shapes and the surface areas and volumes of three-dimensional figures;
 - * verify, through investigation facilitated by dynamic geometry software, geometric properties and relationships involving two-dimensional shapes, and apply the results to solving problems.
 - Specific Curriculum Expectations
- Please refer to Ontario Ministry of Education curriculum document for details of Overall and Specific Expectations, found at <http://www.edu.gov.on.ca/eng/curriculum/secondary/math910curr.pdf>

3. Program Planning Considerations

- *Individual Education Plan*: Accommodations to meet the needs of exceptional students as set out in their Individual Education Plan will be implemented within the classroom program. Additional assistance is available through the Special Education program.
- *The Role of Technology in the Curriculum*. Using information technology will assist students in the achievement of many of the expectations in the curriculum regarding research, written work, analysis of information, and visual presentations.
- *English As a Second Language (ESL)*: Appropriate accommodations in teaching, learning, and evaluation strategies will be made to help ESL students gain proficiency in English, since students taking ESL at the secondary level have limited time in which to develop this proficiency.
- *Career Education*: Expectations in this course include many opportunities for students to explore educational and career options, and to become self-directed learners.
- *Cooperative Education and Other Workplace Experiences*: The knowledge and skills students acquire in this course will assist them in their senior level cooperative-education and work-experience placements related to this course. General information about cooperative education courses can be found at <http://www.edu.gov.on.ca/eng/document/curricul/secondary/coop/cooped.pdf>

4. Learning Skills

Learning Skills are skills and habits essential to success in school and in the workplace. The Learning Skills evaluated are: **Responsibility, Organization, Independent Work, Collaboration, Initiative and Self-regulation**. Teachers report achievement on the six Learning Skills using letter symbols: **E = Excellent, G = Good, S = Satisfactory, N = Needs Improvement**.

Learning Skills clearly affect levels of achievement, but they are *not* part of the evaluation of achievement and are not included in the midterm mark or final course mark.

5. Academic Honesty: Cheating and Plagiarism

Students are expected to submit only their own original work on evaluations done in class or out of class. Plagiarism the passing off the ideas or writings of another as one's own. Cases of academic dishonesty (cheating and/or plagiarism) will be dealt with on a case-by-case basis, but each case will involve an investigation, communication with the student and his/her parent/guardian, and a mark of zero for the plagiarized work. Whether the student has an opportunity to demonstrate his/her learning in another assignment will be at the discretion of the teacher and/or Principal.

6. Teaching Strategies

Teachers use a variety of teaching strategies to maximize student learning. The following teaching strategies will be used in this course:

- *Direct Instruction* is highly teacher-directed. This strategy includes methods such as lecture, didactic questioning, explicit teaching, practice and drill, and demonstrations.
- *Indirect Instruction* is mainly student-centered. Indirect Instruction includes inquiry, induction, problem solving, decision making, and discovery.
- *Interactive Instruction* relies heavily on discussion and sharing among participants. Interactive instruction may include total class discussions, small group discussions or projects, or student pairs or triads working on assignments together.
- *Experiential Learning* is inductive, learner centered, and activity oriented. In Experiential Learning, students participate in an activity; critically look back on the activity to clarify learnings and feelings; draw useful insights from such analysis; and/or put learnings to work in new situations.
- *Independent Study* refers to the range of instructional methods which are purposefully provided to foster the development of individual student initiative, self-reliance, and self-improvement. The focus is on planned independent study by students under the guidance or supervision of a classroom teacher.

7. Assessment and Evaluation Strategies

Assessment and Evaluation of Student Achievement

The primary purpose of assessment and evaluation is to improve student learning. Assessment is the process of gathering information from assignments, demonstrations, projects, performances, and tests that accurately reflects how well a student is achieving the curriculum expectations in a course. As part of assessment, teachers provide students with feedback that guides their efforts towards improvement.

Evaluation refers to the process of judging the quality of student work on the basis of established criteria, and assigning a value to represent that quality. In Ontario secondary schools, the value assigned will be in the form of a percentage grade.

- In this course, the following evaluation strategies will be used: **assignments, investigations (projects), in-class activities, mini and unit evaluations, summative evaluation as end of term exam.**

8. Achievement Chart

The achievement chart provides a standard, province-wide method for teachers to use in assessing and evaluating their students' achievement. Students are evaluated according to the major categories or strands in each course. Ministry curriculum documents provide detailed description of student achievement levels.

In this course, students are evaluated in four categories, according to the weightings shown:

Knowledge/Understanding	Thinking/Inquiry	Communications	Application
30%	20%	20%	30%

9. 70% Mark on Course Work

- Students need to demonstrate achievement of all the overall expectations of the course. 70% of the final mark in the course will be based on work done prior to the culminating activities. **Evaluations that are late, missing, and/or incomplete will affect a student's 70% grade.** See FHCI Evaluation Policy as printed in the Student Agenda Book for information about late, missed, and/or incomplete assignments.
- See outline on next page for information regarding timing of evaluations.

10. 30% Grade Based on Course Culminating Activities

- All students must take part in the culminating activities for each course at every grade and level of study. The steps to follow when a student is absent from one or more culminating activities is included in the FHCI evaluation policy as printed in the Student Agenda Book.
- Culminating activities that occur in class are held within the last three weeks of classes. Culminating activities that are formal examinations occur within the last nine days of the semester.
- In this course, all students will write the mandatory EQAO math test. Passing this test is *not* a graduation requirement. In addition, students will write a common exam, set by the FHCI teachers of the course.

11. Determining Marks for the Midterm Provincial Reports in November and April

This grade will be based on the evaluations that have been conducted to the midterm point in the course. Some of the Overall Expectations, categories/strands, and units will not have been addressed by the midterm, and the students' grades will most likely change when the students' entire work is evaluated by the end of the course.

12. Determining the Mark for the Final Report Card

The mark for the final will report card will be the sum of the 70% mark and the 30% mark.

13. Missed tests/quizzes policy

If a student is legitimately absent for a test or quiz, upon return to school, they must have a doctor's note or a note from their parent or guardian stating the reason for their absence. At that time, and at the convenience of the teacher, the student will write a makeup test. If a student does not have a valid reason for his/her absence, **a mark of zero will be given.** *Every effort will be made by the subject teacher to notify students well in advance of scheduled test dates.*

Definition of Legitimate Absence

- Illness with a doctor's note
- Death in the family
- Medical appointment (Advance notice required)
- Religious reasons (Advance notice required)
- School authorized field trip (Advance notice required)
- Court appearances (Advance notice required)

GRADE 9 ACADEMIC: STUDENT'S COURSE OUTLINE

Course Code: MPM1D
 Textbook: Principles of Mathematics 9, Ontario Edition; Nelson, 2008

UNIT 1: NUMERACY

Integers: § Adding/Subtracting § Multiplying/Exponents/Dividing § Order of Operations	3 Periods	Integers Worksheets for 3 periods, plus: Day 1: Pg 493 # 1-4 Day 2: Pg 494 #1-4 Day 3: Pg 35 #4, 8 Pg 492 #1 Pg 495 #1-2
Multiplying Rational Numbers § Review various fraction forms	1 Period	Rational Numbers Worksheets, plus: Pg 498 #1-2 Pg 28 #6ab, 7, 13 Pg 45 #1-3, 6, 7
Dividing Rational Numbers	1 Period	Rational Numbers Worksheets, plus: Pg 498 #3-4 Pg 29 #6cd, 10, 14 Pg 53 #2cd, 3, 9
Adding and Subtracting Rational Numbers	1 Period	Rational Numbers Worksheets, plus: Pg 16 #4, 8, 9, 10, 13 Pg 497 #1-4 Pg 28 #2ab, 8
Order of Operations with Rational Numbers	1 Period	Rational Numbers Worksheets, plus: Pg 55 #14, 15, 17 Pg 499 #1 Pg 63 #1, 2, 6, 13
REVIEW	1 Period	Pg 40 #1, 3, 5, 6, 12 Pg 66 #1, 3, 4, 6, 9, 17, 20
Chapter Evaluation #1	1 Period	

UNIT 2: POLYNOMIALS & POWERS

<i>Exponents, Powers, and Variables</i>	1 Period	Pg 80 #1 – 5, 7 & Worksheets
Exponent Rules Day 1: Multiplication and Division Laws Day 2: Power of a Power Law	2 Periods	Day 1: Pg 89 #1 – 13 Day 2: Pg 96 #1 – 4, 6 – 11, 13 – 16, 19
Adding Polynomials and Subtracting Polynomials	2 Periods	Pg 109 #2, 5, 7, 9 – 12, 16, 17, 20 -21 & Worksheets
Multiplying a Polynomial by a Monomial	1 Period	Pg 116 #2-4, 6-8, 11
Simplifying Polynomial Expressions	1 Period	Pg 125 #1, 2, 5 – 9, 12, 14, 15, 16
Factoring Expressions with Common Factors	1 Period	Pg 117 #7, 12, 13
REVIEW	1 Period	
Chapter Evaluation #2	1 Period	

UNIT 3: SOLVING EQUATIONS

Solving One-step Equations	1 Period	Pg 505 #1-4 & Worksheets
Solving Multi-Step Equations and Solving Equations with the Variable on Both Sides	1 Period	Pg 210 #4, 10 Pg 221 #5 – 6, 22 & Worksheets
Solving Equations with Brackets	1 Period	Pg 212 #16a Pg 221 #7 & Worksheets
Solving Equations with Fractions	2 Periods	Day 1: Pg 211 #12, 16b Pg 221 #11, 12, 18 Pg 228 #5, 6 & Worksheets
Using Equations to Solve Problems (Look at different types of problems)	2 Periods	Day 1: Pg 211 #11 Pg 221 #8-10, 13, 15 & Worksheets Day 2: Pg 235 #1, 4, 7
WORK PERIOD-Problem Solving	1 Period	Choose a variety of problems/applications
REVIEW	1 Period	
Chapter Evaluation #3	1 Period	

UNIT 4: EQUATIONS OF LINES

Graphing Ordered Pairs	1 Period	Pg 138 # 2 Pg 503 #1-4 & Worksheets
Graphing Linear Equations (Table of Values)	1 Period	Worksheets
Graphing Linear Relations and Direct/Partial Variation Non-Linear Relations	2 Periods	Pg 146 #3, 5, 8, 9, 10, 12, 14 Pg 151 #1-3 & Worksheets
Finite Differences ; Slope, Slope as a Rate of Change (Discuss the 3 methods for determining if an equation is linear)	2 Periods	Day 1: Pg 284 #8 – 13 & Worksheets Day 2: Pg 278 #1-9, 12 – 15, 18, 20
Linear Equations: Point-Slope Form	2 Periods	Day 1: Pg 291 #3a, 5, 6, 7, 8ab & Worksheets Day 2: Pg 291 #3b, 8cd, 9, 11 & Worksheets
Linear Equations: Slope and y-intercept form Day 1: Finding the Slope and y-intercept Day 2: Horizontal and Vertical Lines	2 Periods	Day 1: Pg 159 #17 Pg 171 #15, 16 Pg 269 # 1, 3, 5 & Worksheets Day 2: Pg 270 #6, 12, 14, 15 & Worksheets
Other Methods for Graphing Linear Equations	2 Periods	Pg 170 #4, 8 & Worksheets
Intersecting Lines	1 Period	Pg 245 #1, 3, 6, 8, 12
Parallel and Perpendicular Lines	2 Periods	Pg 302 #1-12, 15 & Worksheets
REVIEW	2 Periods	
Chapter Evaluation #4	1 Period	

UNIT 5: ANGLES

Interior and Exterior Angles in Triangles and Quadrilaterals	1 Period	Pg 384 #1 – 5, 7 & Worksheets
Angles and Parallel Lines	1 Period	Pg 394 #2 – 8 Pg 223 #21 Pg 508 #1-2 & Worksheets
REVIEW	1 Period	
Small Evaluation (this unit may be combined with unit 6, if desired)	1 Period	

UNIT 6: MEASUREMENT & GEOMETRY

Pythagorean Theorem Activity	1 Period	Pg 445 #1 – 6, 9, 11 Pg 513 # 1-6
Review of Formulas for Perimeter and Area and Optimizing Area and Perimeter	1 Period	Pg 431 #1 – 8, 10 & Worksheets
Area of Composite Figures	1Period	Pg 440 # 1ab, 2 – 7, 9, 10
Surface Area and Volume of a Prism	1 Period	Worksheets
Surface Area and Volume of a Cylinder and a Cone	1 Period	Pg 464 #6, 10 & Worksheets
Surface Area and Volume of a: Day 1: Pyramid Day 2: Sphere	2 Periods	Day 1: Pg 464 #4, 7, 8 & Worksheets Pg 455 #6, 7 Day 2: Pg 470 #1 – 5, 6a, 7, 9a, 11, 13, 14
Optimizing Volume and Surface Area	1 Period	Pg 480 # 1-3
REVIEW	1 Period	
Chapter Evaluation #6	1 Period	

UNIT 7: RELATIONSHIPS & STATISTICS

Scatter Plots & Lines of Best Fit: Activity	1 Period	Handout: “Scatter Plots to Show Relationships”
Relationships/Interpreting Graphs: Activity	1 Period	Handout: “Combination Relationships”
Slopes & Linear Models: Activity	1 Period	Handout: “Slopes & Linear Models”
Equations of Lines of Best Fit	1 Period	Pg 337 #1-5
Describing Situations from Graphs	1 Period	Pg 368 #1-5
Ratios, Equivalent Ratios & Proportions	1 Period	Pg 506 #1 – 4 & Worksheets
Rates, Unit Pricing, and Percentages	1 Period	Worksheets
REVIEW	1 Period	
Small Evaluation	1 Period	