JARVIS COLLEGIATE INSTITUTE

MPM1D Course Outline 2009-2010

This Course Outline is based upon the Ministry of Education and Training Ontario Curriculum for Grade 9 Academic Mathematics as per the revised document of 2005.

Board:	Toronto District School Board
School:	Jarvis Collegiate Institute
Curriculum Leader:	T. Paradellis
Developing Teachers:	K. Lew, A. McPhee, T. Paradellis & K. Rigas
Date of Revision:	June 2009
Course Title:	Principles of Mathematics, Grade 9, Academic
Grade:	9
Code:	MPM1D
Credit Value:	1.0
Textbooks:	Principles of Mathematics 9, McGraw-Hill Ryerson (2006) Exercise & Homework Book for Principles of Mathematics 9, McGraw-Hill (2006) Grade 9 Academic Mathematics Workbook – Revised, Tree House (2007)
Resources:	Teacher-made Worksheets – Course Binder Manipulatives, Graphing Calculators & Geometer's Sketchpad TIPS4RM Materials (2006) & EQAO Materials (2006) Algebra with Pizzazz & Pre-Algebra with Pizzazz

Course Description

This course enables students to develop an understanding of mathematical concepts related to algebra, analytic geometry, and measurement and geometry through investigation, the effective use of technology, and abstract reasoning. Students will investigate relationships, which they will then generalize as equations of lines, and will determine the connections between different representations of a linear relation. They will also explore relationships that emerge from the measurement of three-dimensional figures and two-dimensional shapes. Students will reason mathematically and communicate their thinking as they solve multi-step problems.. Throughout the course, students will engage in the following processes: Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting, Representing, Communicating.

Strands

Number Sense and Algebra	41 periods
Linear Relations	22 periods
Analytic Geometry	19 periods
Measurement and Geometry	19 periods

Program Planning Considerations

Exceptional Students*:*	Additional time will be allowed for tests. Additional accommodations will be provided in consultation with the Guidance, Special Education and ESL departments.
Technology:	Manipulatives, Graphing Calculators, and Geometer's Sketchpad will be utilized for hands-on and technology-related applications.
Career Education:	Links to related fields will be established throughout the course.
Co-operative Education*:*	These will be provided in association with Guidance Department.
Mathematics Anxiety*:*	Attention will be addressed according to the following: • Cultural perspectives • Positive reinforcements • Variety of assessment techniques • Group structures • Consideration for Learning Styles

Learning Skills

Assessment of the learning skills will be done on an ongoing basis throughout the academic year by observations of students at work, checklists and interviews. This will include:

Classwork/homework	(Work habits, homework and organization)
Completed work and seeking assistance	(Organization and initiative)
Persistence and independence at tasks	(Working independently and initiative)
Extension of task	(Organization and initiative**)**
Achievement of group goals	(Team work)

Assessment Strategies
A variety of teaching/assessment strategies to address students' needs will be used during the school year. Formative assessments will be ongoing through out the academic year. These may include:

- Diagnostic assessment
- Formative assessment
- Performance assessment
- Portfolio assessment
- Rubrics
- Checklists

Term Summative Evaluations (70% Term Work)

- Tests, quizzes, tasks and other forms of term summative evaluations will occur throughout the academic year at the end of units of work as outlined in the accompanying course outline.
- Students will be provided with reasonable opportunities to master skills relating to the achievement of the curriculum expectations before assessment and evaluation occurs.
- Major evaluations will be announced at least one week in advance.
- Accommodations will be made for school activities, statutory holidays, religious days, cultural days, sports events and other occurrences that may impact on any scheduled evaluation. It is the student's responsibility to notify teachers of such absences in advance and to make up missed work.
- Absence on the day of an evaluation must be documented. If a student must miss an evaluation, s/he is expected to:
  a) see the teacher before the absence to arrange for an alternative date to make up the evaluation; or
  b) in case of illness or unexpected absence, present a note to the teacher, signed by a parent or guardian, immediately upon their return to explain the absence. An alternate evaluation will then be scheduled at a mutually convenient time.
- The Jarvis Late Policy applies to all assignments and evaluations. See your Agenda book.
- Cheating will not be tolerated in any form and will be dealt with appropriately.

Final Mark Calculation
Calculation of the Term Mark will be based upon the ***Categories*** of the ***Achievement Chart***. This chart is meant to assist teachers in planning instruction and learning activities for the achievement of the curriculum expectations. It is also used in designing assessment and evaluation tools and in providing feedback to students. Each mathematical topic will contain each category in the chart due to the integrated nature of the discipline in mathematics. Final marks will be calculated as follows:

Term Work:		**70%**	***Levels of Achievement:***
Knowledge and Understanding:	35%		Level 1: 50 – 59%
Application:	35%		Level 2: 60 – 69%
Thinking and Inquiry:	15%		Level 3: 70 – 79%
Communication:	15%		Level 4: 80 – 100%
Final Summative Evaluations:		**30%**	
EQAO Assessment	10%		
Final Summative Evaluations	20%		

Reporting

Report #1	Report #2	June Report
100% Term Work	100% Term Work (Cumulative Sept – Feb)	70% Term Work + 10% EQAO + 20% Final Evaluations (Cumulative Sept to June)

Communication
Access to extra help and mark records. Students are encouraged to consult their teachers on a regular basis for extra help and guidance as it relates to improving their academic performance. Students are also expected to discuss strategies for improving their grades with their teachers. Students are expected to view their report cards as an indication of their current achievement and discuss with teachers for clarification.

Communication with Parents/Guardians. Comments pertaining to academic achievement and learning skills are placed on the report cards are primarily to provide feedback for parents/guardians as well as students. Parent/guardian nights can be used for one to one discussion. At times it may be necessary to contact parents/guardians by telephone to discuss a student's performance. Parents/guardians are also encouraged to contact teachers as and when the need arises.

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MPM1D Daily Course Outline 2009-2010

Textbook: Principles of Mathematics 9, McGraw-Hill Ryerson (2006) **[TXT]**
Exercise & Homework Book for Principles of Mathematics 9, McGraw-Hill (2006) **[HwBk]**
Grade 9 Academic Mathematics Workbook – Revised, Tree House (2007) **[EQAO]**

Strand #1: Linear Relations (22 periods)

Overall Expectations:

- To apply data management techniques to investigate relationships between two variables;
- To determine an understanding of the characteristics of a linear relation;
- To connect various representations of a linear relation.

Strand #2: Number Sense and Algebra (41 periods)

Overall Expectations:

- To demonstrate an understanding of the exponent rules of multiplication and division, and apply them to simplify expressions;
- To manipulate numerical and polynomial expressions;
- To solve first-degree equations.

Per #	TOPIC	Section	ASSIGNMENT – in Course Binder	Comment
UNIT #1: ANALYSING DATA (4 periods)				
1	Course Introduction Scatter Plots, Trends, Interpolation & Extrapolation – by hand	 2.3 2.4	Un 1 Intro Sheet Investigation #1 Assignment #1	Begin course with Investigations. Vocab: Indep vs Dep Variable, Outlier, Trend, Inference
2	Scatter Plots, Trends, Interpolation & Extrapolation – by hand	2.3 2.4	Investigation #2 Assignment #2	
3	Scatter Plots, Trends, Interpolation & Extrapolation – by hand	2.3 2.4	Assignment #3	
4	Performance Task			
UNIT #2: INTEGERS & RATIONAL NUMBERS (11 periods)				
1	Adding Integers	Pre-req Skills	Un 2 Intro Sheet Assignment #1 & AP 12	**Keep to these timelines.** Integers & Rationals will be revisited in Units 3 & 4 to reinforce Number Sense skills.
2	Subtracting Integers	Pre-req Skills	Assignment #2 & AP 18	
3	Multiplying & Dividing Integers	Pre-req Skills	Assignment #3 (AP 17 & 19)	
4	Powers & Order of Operations with Integers	Pre-req Skills	Assignment #4 & AP	
5	Integer Review Ordering & Graphing Rational Numbers	Pre-req Skills	Assignment #5	
6	Integer TEST			
7	Adding & Subtracting Rational Numbers	1.5	Assignment #6	
8	Multiplying & Dividing Rational Numbers	1.5	Assignment #7	
9	Exponents & Order of Operations	3.2	Assignment #8	
10	Review		Review Sheet	
11	TEST			
UNIT #3: LINEAR & NON-LINEAR RELATIONS (5 periods)				
1	Plotting Points in the Cartesian Plane		Un 3 Intro Sheet Assignment #1 (PAP 231-232)	
2	Graphing Linear Relations – by hand		Assignment #2 (AP 146 & PAP 133))	Teach substitution.
3	Graphing Linear & Nonlinear Relations – by hand		Assignment #3	
4	Review		Test Review Sheet	
5	Mini-test Graphing Relations using TI-83		Investigation sheet	Experiment with effect of coefficients and exponents on graphs of relations.
UNIT #4: POLYNOMIALS (9 periods)				
1	Collecting Like Terms	3.5	Un 4 Intro Sheet Assignment #1	
2	More Collecting Like Terms & Perimeter		Assignment #2	
3	Distributive Property (I)	3.7	Assignment #3	
4	Multiplying Monomials	3.3	Assignment #4	
5	Distributive Property (II)	3.7	Assignment #5	

Per #	TOPIC	Section	ASSIGNMENT – in Course Binder	Comment
6	Mini-Test Powers of Monomials	3.3	Assignment #6	
7	Dividing Monomials	3.3	Assignment #7	Positive exponents only
8	Test Review		Review Sheets EQAO – pp. 17-25	
9	TEST			
UNIT #5: EQUATIONS (8 periods)				
1	One-Step Equations	4.1	Un 5 Intro Sheet Assignment #1	
2	Two-Step Equations	4.1	Assignment #2	
3	Variables on Both Sides & Distributive Law	4.2	Assignment #3 & 4	
4	Equations Review	4.2	Assignment #5	
5	Minitest Fractional Equations	4.3	Assignment #6	
6	Rearranging Formulae	4.4	Assignment #7	
7	Review		Assignment #8 & Review Sheet	
8	TEST			
1 & 2	**Cumulative Review**		**Review Sheets**	**Before Winter Break**
3	**CUMULATIVE TEST #1 (Units #1-5)**			
UNIT #6: APPLICATIONS OF EQUATIONS (13 periods)				
1 & 2	Pythagorean Theorem & Applications	8.1	Assignment #1 & 2 (PAP 166 & AP 206)	
3	Translating Words into Math		Vocabulary Sheet Translation Sheet AP 10 & PAP 214	
4	Word Problems – Single Quantity	4.5	Assignment #3 & AP 39	
5	Word Problems – Two & Three Quantities	4.5	Assignment #4 & AP 57	Direct Translation Problems only
6	More Word Problems – Multiple Quantities	4.5	Assignment #5	
7	Word Problem Review		WP Review Sheet	
8	TEST			
9	Word Problems – Proportions		Assignment #6	
10	Word Problems - Ratios		Assignment #7	
11	Word Problems – Percents		Assignment #8	
12	Review		Review Sheets EQAO – pp. 26-35	
13	TEST			
UNIT #7: MODELLING WITH GRAPHS (5 periods)				
1	Investigation #1: Stacking Books		Investigation #1	
2	Investigation #2: Patterning Finite Differences	5.5	Investigation #2	
3	Applications of Linear Relations: Direct vs Partial Variation – by hand	5.1 5.2	Assignment #3	
4	Applications of Linear Relations w/ TI-83		Assignment #4	Skills: Y=, TABLE, WINDOW, TRACE, INTERSECTION
5	Test Review		Review Sheet	
6	TEST and/or Performance TASK			
UNIT #8: SLOPE & ITS APPLICATIONS (8 periods)				
1	Slope – given a Graph	5.3	Lesson & Assignment #1	
2	Point-slope Graphing & Geometry Applic.		Assignment #2	
3	Slope – given Two Ordered Pairs	5.3	Assignment #3	
4	Slope as a Rate of Change	5.4	Lession & Assignment #4	
5 & 6	CBR Activities: Describing Action & Calculating Velocity	2.6	CBR Sheets & Assignment #	
7	Review		Test Review Sheets EQAO pp. 36-63	
8	Test and/or Performance Task			

Strand #3: Analytic Geometry (19 periods)

Overall Expectations:

- To determine the relationship between the form of an equation and the shape of its graph with respect to linearity and non-linearity;
- To determine, through investigation, the properties of the slope and y-intercept of a linear relation;
- To solve problems involving linear relations.

Per #	TOPIC	Section	ASSIGNMENT	Comment
UNIT #9: ANALYSE LINEAR RELATIONS (19 periods)				
1	Equation of a Line: y = mx + b	6.1	Investigation Sheet Assignment #1 (AP 155 & 154)	
2	Equation of a Line: Ax + By + C = 0 (Rearranging for y)	6.2	Lesson sheet Assignment #2 (AP 156 &157)	
3	Linear Systems – graphically by hand	6.7	Assignment #3 (AP 161-162)	
4	QUIZ Parallel & Perpendicular Lines	6.4	Investigation Sheet Assignment #4	
5	Graphing a Line Using Intercepts	6.3	Assignment #5	
6	Test Review		Review Sheets	
7	TEST			
8 & 9	Lines of Best Fit – By hand		Activity Sheets – by hand	
10 & 11	Lines of Best Fit - using TI-83		Activity Sheets – TI-83	Use TI-83 Instructions sheet
12 & 13	Application of Linear Systems – using TI-83	6.7	Activity Sheets – TI-83	Skills: WINDOW & INTERSECTION
14	Equation of a Line – given Slope & a Point	6.5	Assignment #6	
15	Equation of a Line – given Two Points	6.6	Assignment #7	
16	Applications of the Straight Line		Assignment #8	
17	Equation of a Line – intercepts, parallel, perp		Assignment #9	
18	Review		Assignment #10 EQAO pp. 74-91	
19	Test #2 and/or Performance Task		Line Design Project	
1, 2 & 3	**SUMMATIVE REVIEW (Units #1-9)**		**Review Sheets**	**Mid-May**
4	**SUMMATIVE EVALUATIONS (Units #1-9) - 20% of Final Mark**			

Strand #4: Measurement & Geometry (19 periods)

Overall Expectations:

- To solve problems involving the measurements of two-dimensional shapes and the surface areas and volumes of three-dimensional figures;
- To determine, through investigation, the optimal values of various measurements;
- To verify, through investigation facilitated by dynamic geometry software, geometric properties and relationships involving two-dimensional shapes, and apply the results to solving problems.

Per #	TOPIC	Section	ASSIGNMENT	Comment
UNIT #10: GEOMETRIC RELATIONSHIPS (5 periods)				
1	Angle Relationships in Triangles	7.1	Investigation Sheets Assignment #1	
2	Angle Relationships in Polygons	7.3	Investigation Sheets Assignment #2	
3	Special Quadrilaterals	7.2	Investigation Sheets Assignment #3	
4	Review		Review Sheets EQAO pp.109-118	
5	Test and/or Performance Task			
UNIT #11: MEASUREMENT RELATIONSHIPS (6 periods)			**** Use EQAO Academic Formula Sheet ****	
1	Perimeter & Area of Composite Figures	8.2	HwBk pp. 134-136	
2	Surface Area & Volume of Prisms & Pyramids	8.3	HwBk pp. 137-138	
3	Surface Area & Volume of Cylinders & Cones	8.4 & 8.5	HwBk pp. 139-143	
4	Surface Area & Volume of Spheres	8.6 & 8.7	HwBk pp. 144-148	
5	Review		HwBk pp. 149-150 EQAO pp. 92-100	
6	Test and/or Performance Task			
UNIT #12: OPTIMIZING MEASUREMENTS (8 periods)				
1	Investigate Measurement Concepts	9.1	HwBk pp. 151-153	
2	Perimeter & Area Relationships of a Rectangle	9.2	HwBk pp. 154-155	

3	Minimize the Surface Area of a Square-Based Prism	9.3	HwBk pp. 156-158	
4	Maximize the Volume of a Square-Based Prism	9.4	HwBk pp. 159-160	
5	Maximize the Volume of a Cylinder	9.5	HwBk pp. 161-162	
6	Minimize the Surface Area of a Cylinder	9.6	HwBk pp. 163-164	
7	Review		HwBk pp. 165-166	
8	Test and/or Performance Task			
1, 2 & 3	**EQAO Practice Materials**			
	EQAO Assessment (10% of Final Mark)			