Course Outline – Principles of Mathematics Grade 9 (MPM 1D)

GRANITE RIDGE EDUCATION CENTRE

Date: September 2013
Department: Mathematics
Credit Value: 1.0

Teacher: Mr. Smith, Mr. Laan
Department Head: Mr. Smith
Prerequisite(s): Grade 8 Mathematics

Policy Documents

The Ontario Curriculum: Grades 9 and 10: Mathematics (2005)
Ontario Secondary Schools 9 to 12 - Program and Diploma Requirements (1999)

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.

Overall Curriculum Expectations and Summative Tasks

Strand: Number Sense and Algebra

By the end of this course, students will:

1 demonstrate an understanding of the exponent rules of multiplication and division, and apply them to simplify expressions

2 manipulate numerical and polynomial expressions, and solve first-degree equations

Strand: Linear Relationships

By the end of this course, students will:

3 apply data-management techniques to investigate relationships between two variables

4 demonstrate an understanding of the characteristics of a linear relation

5 connect various representations of a linear relation

Strand: Analytic Geometry

By the end of this course, students will:

6 with respect to linearity and non-linearity determine the relationship between the form of an equation and the shape of its graph

7 determine, through investigation, the properties of the slope and y-intercept of a linear relation

8 solve problems involving linear relations

Strand: Measurement and Geometry

By the end of this course, students will:

9 determine, through investigation, the optimal values of various measurements

10 solve problems involving the measurements of two-dimensional shapes and the surface areas and volumes of three-dimensional figures

11 verify, through investigation facilitated by dynamic geometry software, geometric properties and relationships involving two-dimensional shapes, and apply the results to solving problems

70% Term Summative Assessment Tasks

Expectations Evaluated	Description of Summative Assessment Task	Due Date	Mark Achieved
11	**Unit 1 – Angle Geometry (6 periods): Test** *(Angle Theorems, Properties of Polygons)*		
9, 10	**Unit 2 – 2D Measurement (6 periods): Assignment** *(Perimeter & Area of Composite Shapes, Optimization)*		
3, 4, 5	**Unit 3 – Relationships and Rates (10 periods): Task** *(Scatter Plots, Trends & Fit, Graphical Stories, Rates of Change)*		
4, 5	**Unit 4 – Linear Relations (10 periods): Test** *(Linear Models using Tables, Graphs and Equations)*		
2, 8, 10, 11	**Algebra & Number Sense (6 periods in semester): Task #1** *(Variables, Modeling, Evaluating, Solving Equations)*		
Semester Break			
10	**Unit 5 – 3D Measurement (8 periods): Assignment** *(Volume, Surface Area, Pythagorean Theorem)*		
2, 8, 10	**Algebra & Number Sense (10 periods in semester): Task #2** *(Solving Equations, Grouping and Multiplying Polynomials)*		
6, 7, 8	**Unit 6 – Analytic Geometry (12 periods): Assignment & Test** *(Abstract Linear Models using y=mx+b, Ax+By=C)*		
1	**Unit 7 – Proportions & Exponents (6 periods): Assignment** (Ratios & Rates, *Operations with Fractions, Exponent Laws*)		

Note: Tasks listed may change during the course to allow for teacher to respond to student learning.
Students will be notified in advance of any changes to the summative assessment tasks.
All summative tasks must be submitted before a credit is granted.

30% Final Summative (or Culminating) Activities

Expectations Evaluated	Description of Final Summative Assessment Task	Mark Achieved
1 – 11	**EQAO: Written Test over two days. (15% of final grade)**	
2 – 10	**Performance Task: Murder Mystery (15% of final grade)**	

Note: Tasks listed may change during the course to allow for teacher to respond to student learning.
Students will be notified in advance of any changes to the summative assessment tasks.
All summative tasks must be submitted before a credit is granted.

Literacy Components for Math Department (Graphical Reading and Communication)

During the instruction and assessment of the overall expectations, both graphical readings and communication of mathematical thinking will be points of emphasis in this course. In formative, summative and final summative tasks, graphical readings will be used to help students enhance that specific literacy skill and communication will be stressed separately of mathematical knowledge, thinking and application so that students develop the ability to explain their understanding with proper mathematical notation, logical steps and sound paragraph writing.

Core Texts: Principles of Mathematics 9, Nelson

Assessment and Evaluation Overview

1. Learning Skills and Work Habits Achievement:

Learning skills and work habits are instructed, assessed and evaluated separately from your academic work. You will be assessed frequently on your level of achievement of the following six learning skills and work habits (e.g. through conferences with your teacher; observation during class activities; and completion of assignments where specific learning skills are addressed). Learning skills and work habits will be evaluated at mid-term and again at the end of the semester with a letter grade (E = Excellent, G = Good, S = Satisfactory, N = Needs Improvement).

LEARNING SKILL	STUDENT LOOK FORS
Responsibility	• I come to class regularly and on time • I submit assignments on time • I complete homework and study for summative tasks • I am responsible for my behaviour
Organization	• I come to class prepared with the appropriate materials • I organize my notes and materials • I schedule my time to complete all tasks
Independent Work	• I begin work promptly • I use class time wisely • I follow directions from my teacher
Collaboration	• I contribute to a positive classroom experience for all • I help others learn • I am respectful of others ideas and opinions
Initiative	• I show interest in class and participate • I ask for help when needed • I persevere and work hard to complete tasks
Self-Regulation	• I set goals for myself and work to achieve them • I understand how my learning skills & work habits affect my academic success • I will use teacher feedback to improve

2. Achievement of Overall Course Expectations:

Diagnostic and Formative Assessment Tasks will be used throughout the course and may include quizzes, assignments, activities and investigations. Feedback will be used to help students and teachers to determine next steps to achieve the provincial standard on the overall expectations. These assessment tasks will not be used in the determination of grades.

Summative Assessment Tasks will usually be administered at or near the end of a period of learning and may include performance tasks, portfolios of student work, and projects, and unit tests. Summative assessment tasks will be used to evaluate student learning in relation to the overall expectations of the course. Evaluation of the summative assessment tasks will be used to determine the term grade and will be worth seventy percent (70%) of the final grade for the course. The mid-term grade will be derived from evaluation of the summative assessment tasks completed up until that point. As students progress through the course, their grades will represent the students' most consistent levels of achievement of overall expectations. Where overall expectations are evaluated more than once during the term, evidence of growth will be considered in determining the final grade.

Final Summative Tasks will be administered at or near the end of the course. Thirty percent (30%) of the final grade will be based on the evaluation of final summative tasks in the form of an examination and/or other culminating activities. The tasks will be based on overall expectations from all strands and across the categories of knowledge and understanding, thinking, application and communication.

Late or Missing Assignments
Students are expected to submit assignments by the agreed-upon due dates. It is important that all summative assessment tasks be completed so that there is sufficient evidence of achievement of the overall expectations for a credit to be granted. For this reason, missed due dates will result in action on behalf of the school to collect the missing evidence at the earliest opportunity, in accordance with LDSB procedures included in the student agenda. All final summative tasks must be completed before a credit is granted.

Academic Honesty
Academic honesty is a fundamental cornerstone in student learning. A breach of academic honesty is the theft of intellectual property and is treated with the utmost seriousness. All breaches of academic honesty will be reported to the school administration and a plan of action will be implemented in accordance with LDSB procedures included in the student agenda.

Attendance and Punctuality
Regular attendance and punctuality are expected, as they contribute to success at school and are important requirements in the workplace. It is essential that you contact your teacher when you know you will be absent. Following an absence, it is critical that you work diligently to catch up on missed work. Attendance and punctuality are reported on the provincial report card. Refer to the student agenda for further details.

Teaching and Learning Strategies:
Students typically demonstrate diversity in the ways they learn best. In mathematics, students are required to learn concepts, procedures, and processes, and they become proficient in these areas with the aid of the instructional and learning strategies best suited to the particular type of learning. It is important then that students have opportunities to learn in a variety of ways – individually, cooperatively, independently, with direction, hands-on, visual and oral experiences, using examples followed by practice, utilizing rich problems and investigations. Group work will be used as an instructional strategy to reinforce learning skills and help introduce new mathematical concepts and strategies. Learning through both problem solving and inquiry are key teaching and learning strategies achieved by using rich problems and investigations and allow students to apply their knowledge, think mathematically, and structure their past learning. Helping students learn concepts visually and also understanding the links between the visual and algebraic in mathematics is essential. Instructional and learning tools that will be used to help students learn visually include the blackboard and technological assists such as overheads, Smartboards, animations, computer graphing programs, and graphing calculators. Hands-on experiences using manipulatives will also be used when possible as concrete learning tools as they allow students to explore and represent abstract mathematical ideas in varied, concrete, tactile, and visually rich ways. *If you ever experience difficulty with concepts taught in class you are encouraged to discuss these with your teacher*. Struggling to learn math concepts is common and one strategy to improve your learning is to get teacher help in one-on-one or small group help sessions during appropriate times in class or when it is convient for all involved outside of class time.

Education for Exceptional Students:
All students require support from teachers, classmates, family, and friends in order to thrive and to gain full benefit from their school experience. Some students have special needs that require supports beyond those ordinarily received in the school setting. These needs may be met through accommodations to meet the needs of exceptional students are set out in their Individual Education Plans. There are three types of accommodations. Instructional accommodations are changes in teaching strategies, including styles of presentation, methods of organization, or use of technology or multimedia. Environmental accommodations are changes that the student may require in the classroom and/or school environment, such as preferential seating or special lighting. Assessment accommodations are changes in assessment procedures that enable the student to demonstrate their learning, such as allowing additional time to complete tests or assignment, or permitting oral responses.