

# MFM 1P – Learning Goals and Success Criteria

## Strand: Number Sense and Algebra (NA)

Overall Expectation <i>By the end of this course, students will be able to:</i>	Learning Goal <i>I will be able to:</i>	Success Criteria <i>I can:</i>
Solve problems involving proportional reasoning.	Solve problems involving proportional reasoning. (NA1)	<ul style="list-style-type: none"> <li>• Use a variety of methods to show equivalent ratios;</li> <li>• Use equivalent ratios and proportions to represent real world situations;</li> <li>• Use a variety of methods to solve for the unknown value in a proportion;</li> <li>• Compare quantities using unit rates;</li> <li>• Solve problems involving ratios, rates, and proportional relationships (ex/ currency exchange, scale diagrams, measurement conversions, etc.) using a variety of methods;</li> <li>• Express percents, fractions, and decimals in their equivalent forms, and solve problems involving them.</li> </ul>
Simplify numerical and polynomial expressions in one variable, and solve simple first - degree equations.	Simplify numerical* and polynomial expressions and solve first - degree equations using inverse operations. (NA2)	<ul style="list-style-type: none"> <li>• Simplify expressions involving fractions and integers with and without a calculator*;</li> <li>• Identify inverse operations (ex/ the opposite of adding is subtracting, the opposite of squaring a number is taking its square root), and apply this understanding to solve equations;</li> <li>• Substitute into and evaluate algebraic expressions with exponents;</li> <li>• Add and subtract polynomials involving the same variable;</li> <li>• Use the distributive property to multiply a monomial and a polynomial;</li> <li>• Solve first degree equations with integer coefficients using a variety of methods;</li> <li>• Substitute into algebraic expressions and solve for one variable.</li> </ul>
		*These skills will be introduced and assessed throughout the course.

## Strand: Linear Relations (LR)

Overall Expectation <i>By the end of this course, students will be able to:</i>	Learning Goal <i>I will be able to:</i>	Success Criteria <i>I can:</i>
Apply data management techniques to investigate relationships between two variables.	Collect and interpret data to investigate the relationships between two variables. (LR1)	<ul style="list-style-type: none"> <li>• Interpret the meaning of points on scatter plots that model linear relations, including those that are in more than one quadrant;</li> <li>• Use real world simulations to pose problems, identify variables, and formulate hypotheses for relationships between two variables;</li> <li>• Carry out experiments to test hypotheses, and collect and organize data using appropriate methods;</li> <li>• Describe trends and relationships observed in data using appropriate vocabulary, and explain any differences between the hypotheses and conclusions.</li> </ul>
Determine the characteristics of linear relationships.	Identify linear relationships by their characteristics. (LR2)	<ul style="list-style-type: none"> <li>• Construct tables of values and graphs to represent real world situations described by linear relations;</li> <li>• Construct tables of values, scatter plots, and lines or curves of best fit for data collected from a variety of sources;</li> <li>• Identify properties of linear relationships (ex/ constant first differences, a straight line, etc.), and use these properties to determine whether a relationship is linear or not.</li> </ul>
Demonstrate an understanding of constant rate of change and its connection to linear relations.	Explain why relationships with a constant rate of change represent linear relations. (LR3)	<ul style="list-style-type: none"> <li>• Represent the rate of change of any linear relation by finding two points on the line, finding the vertical change between the points (rise) and the horizontal change between the points (run), and writing the ratio rise/run;</li> <li>• Identify direct and partial variation, and the initial value for both;</li> <li>• Use the rate of change and initial value to write an equation to represent a linear relation arising from a real world situation;</li> <li>• Explain the meaning of the rate of change and initial value in terms of a real world situation.</li> </ul>
Connect various representations of a linear relation, and solve problems using the representations.	Represent linear relations in a variety of ways (table, graph, equation, description), and solve problems using these representations. (LR4)	<ul style="list-style-type: none"> <li>• Determine values of a linear relation using both its equation and graph (interpolate or extrapolate);</li> <li>• Describe a situation that would explain a given graph of two variables;</li> <li>• Use the given representation of a linear relation to determine the other representations;</li> <li>• Solve problems that are modelled with first degree equations algebraically, and compare this method to other solution methods;</li> <li>• Describe the effects on a graph of a linear relation when the rate of change or initial value is changed;</li> <li>• Use a graph to find and interpret the point of intersection of two linear relations in a real world context.</li> </ul>

## Strand: Measurement and Geometry (MG)

Overall Expectation <i>By the end of this course, students will be able to:</i>	Learning Goal <i>I will be able to:</i>	Success Criteria <i>I can:</i>
Determine, through investigation, the optimal values of various measurements of rectangles.	Identify the dimensions that will enclose the maximum area and minimum perimeter for rectangles. (MG1)	<ul style="list-style-type: none"> <li>• Determine the maximum area of a rectangle;</li> <li>• Determine the minimum perimeter of a rectangle;</li> <li>• Solve problems that require maximizing the area of a rectangle given its perimeter, or minimizing its perimeter given its area;</li> </ul>
Solve problems involving the measurements of two - dimensional shapes and the volume of three - dimensional figures.	Find area and perimeter of two - dimensional shapes and the volume of three - dimensional shapes, including composite figures. (MG2)	<ul style="list-style-type: none"> <li>• Relate the geometric and algebraic representations of the Pythagorean Theorem;</li> <li>• Solve problems using the Pythagorean theorem;</li> <li>• Solve problems involving the area and perimeter of composite figures;</li> <li>• Develop the formulas for the volume of a pyramid, cone and sphere;</li> <li>• Solve problems involving the volumes of prisms, pyramids, cylinders, cones, and spheres.</li> </ul>
Determine, through investigation facilitated by dynamic geometry software, geometric properties and relationships involving two - dimensional shapes, and apply the results to solving problems.	Identify two - dimensional shapes using geometric properties, and apply this understanding to various problems. (MG3)	<ul style="list-style-type: none"> <li>• Describe the properties of the interior and exterior angles of triangles, quadrilaterals, and other closed shapes, and apply these properties to solve problems involving the angles of polygons;</li> <li>• Describe the properties of the angles formed by parallel lines cut by a transversal, and apply these properties to problems involving parallel lines.</li> </ul>