|  |  |  |  |
| --- | --- | --- | --- |
| **FOUNDATIONS and PRE-CALCULUS 10 YEAR PLAN 2014-2015**  **Nanchang No. 2 High School**  ***Ms. Lilian Albarico*** | | | |
| **Unit 1 – Measurement**  **(50-55 hours)**  **General Outcome: Develop spatial sense and proportional reasoning.** | | | |
| **CURRICULUM OUTCOMES** | | **UNIT PLAN** | |
| **M01 Students will be expected to solve problems that involve linear measurement, using SI and imperial units of measure, estimation strategies, and measurement strategies.**  *Performance Indicators*  M01.01 Provide referents for linear measurements, including millimetre, centimetre, metre, kilometre, inch, foot, yard, and mile, and explain the choices.  M01.02 Compare SI and imperial units, using referents.  M01.03 Estimate a linear measure, using a referent, and explain the process used.  M01.04 Justify the choice of units used for determining a measurement in a problem-solving context.  M01.05 Solve problems that involve linear measure, using instruments such as rulers, calipers, or tape measures.  M01.06 Describe and explain a personal strategy used to determine a linear measurement (e.g., circumference of a bottle, length of a curve, and perimeter of the base of an irregular 3- D object).  **M02 Students will be expected to apply proportional reasoning**  **to problems that involve conversions between SI and imperial**  **units of measure.**  *Performance Indicators*  M02.01 Explain how proportional reasoning can be used to convert a measurement within or between SI and imperial systems.  M02.02 Solve a problem that involves the conversion of units within or between SI and imperial systems.  M02.03 Verify, using unit analysis, a conversion within or between SI and imperial systems, and explain the conversion.  M02.04 Justify, using mental mathematics, the reasonableness of a solution to a conversion problem.  **M03 Students will be expected to solve problems, using SI and imperial units, that involve the surface area and volume of 3-D objects, including right cones, right cylinders, right prisms, right pyramids, and spheres.**  *Performance Indicators*  M03.01 Sketch a diagram to represent a problem that involves surface area or volume.  M03.02 Determine the surface area of a right cone, right cylinder, right prism, right pyramid, or sphere, using an object or its labelled diagram.  M03.03 Determine the volume of a right cone, right cylinder, right prism, right pyramid, or sphere, using an object or its labelled diagram.  M03.04 Determine an unknown dimension of a right cone, right cylinder, right prism, right pyramid, or sphere, given the object’s surface area or volume and the remaining dimensions.  M03.05 Solve a problem that involves surface area or volume, given a diagram of a composite 3-D object.  M03.06 Describe the relationship between the volumes of right cones and right cylinders with the same base and height, and right pyramids and right prisms with the same base and height. | | **CHAPTER 1 – LINEAR MEASUREMENT and GEOMETRY**   * 1. *– Imperial Measures of Length*   2. *– Measuring Length and Distance*   3. *– Relating SI and Imperial Units*   4. *– Surface Areas of Right Pyramids and Right Cones*   5. *– Volumes of Right Pyramids and Right Cones*   6. *– Surface Area and Volume of Sphere*   7. *– Solving Problems Involving Objects*   *Assessments:*  Journal  Practice Exercises  Quizzes  Chapter test  Project: Geometric Models  *Activities:*  Math Labs  Measuring Solid Figures Activity  Scavenger Hunt Activity  TIME FRAME : September 1-26, 2014  RESOURCES:  Pearson Math 10 textbook, Nelson Math 10 textbook, Geo solid shapes, polyhedrons, surface area/volume media, graphing calculator, meter stick, ruler with imperial and SI units | |
| **M04 Students will be expected to develop and apply the primary trigonometric ratios (sine, cosine,tangent) to solve problems that involve right triangles.**  *Performance Indicators*  M04.01 Explain the relationships between similar right triangles and the definitions of the primary trigonometric ratios.  M04.02 Identify the hypotenuse of a right triangle and the opposite and adjacent sides for a givenacute angle in the triangle.  M04.03 Solve right triangles, with or without technology.  M04.04 Solve a problem that involves one or more right triangles by applying the primary trigonometric ratios or the Pythagorean theorem.  M04.05 Solve a problem that involves indirect and direct measurement, using the trigonometric ratios, the Pythagorean theorem, and measurement instruments such as a clinometer or metre stick. | | **CHAPTER 2 – TRIGONOMETRY**  *2.1 – The Tangent Ratio*  *2.2 – Using the Tangent Ratio to Calculate Lengths*  *2.3 – Measuring an Inaccessible Height*  *2.4 – The Sine and Cosine Ratios*  *2.5 – Using the Sine and Cosine Ratios to Calculate Lengths*  *2.6 – Applying the Trigonometric Ratios*  *2.7 – Solving Problems Involving More than One Right Triangle*  *Assessments:*  Triangle Scavenger Hunt Activity  Designing Triangles  Journal, Practice Exercises  Quizzes, Chapter test, Unit test  Project: Kites  TIME FRAME : October 6-31, 2014  RESOURCES:  Pearson Math 10 textbook, Nelson Math 10 textbook, Geo solid shapes, polyhedrons, graphing calculator, online interactive triangle | |
| **Unit 2 – Algebra and Numbers**  **(50-55 hours)**  **General Outcome: Develop algebraic reasoning and number sense.** | | | |
| **CURRICULUM OUTCOMES** | **UNIT PLAN** | | |
| **AN01 Students will be expected to demonstrate an understanding of factors of whole numbers by determining the prime factors, greatest common factor, least common multiple, square root, and cube root.**  *Performance Indicators*  AN01.01 Determine the prime factors of a whole number.  AN01.02 Explain why the numbers 0 and 1 have no prime factors.  AN01.03 Determine, using a variety of strategies, the greatest common factor or least common multiple of a set of whole numbers, and explain the process.  AN01.04 Determine, concretely, whether a given whole number is a perfect square, a perfect cube, or neither.  AN01.05 Determine, using a variety of strategies, the square root of a perfect square, and explain the process.  AN01.06 Determine, using a variety of strategies, the cube root of a perfect cube, and explain the process.  AN01.07 Solve problems that involve prime factors, greatest common factors, least common multiples, square roots, or cube roots.  **AN02 Students will be expected to demonstrate an understanding of irrational numbers by representing, identifying, simplifying, and ordering irrational numbers.**  *Performance Indicators*  AN02.01 Sort a set of numbers into rational and irrational  numbers.  AN02.02 Determine an approximate value of a given irrational number.  AN02.03 Approximate the locations of irrational numbers on a number line, using a variety of strategies, and explain the reasoning.  AN02.04 Order a set of irrational numbers on a number line.  AN02.05 Express a radical as a mixed radical in simplest form (limited to numerical radicands).  AN02.06 Express a mixed radical as an entire radical (limited to numerical radicands).  AN02.07 Explain, using examples, the meaning of the index of a radical.  AN02.08 Represent, using a graphic organizer, the relationship among the subsets of the real numbers  (natural, whole, integer, rational, irrational).  **AN04 Students will be expected to demonstrate an understanding of the multiplication of polynomial expressions (limited to monomials, binomials, and trinomials), concretely,pictorially, and symbolically.**  *Performance Indicators*  AN04.01 Model the multiplication of two given binomials, concretely or pictorially, and record theprocess symbolically.  AN04.02 Relate the multiplication of two binomial expressions to an area model.  AN04.03 Explain, using examples, the relationship between the multiplication of binomials and the multiplication of two-digit numbers.  AN04.04 Verify a polynomial product by substituting numbers for the variables.  AN04.05 Multiply two polynomials symbolically, and combine like terms in the product.  AN04.06 Generalize and explain a strategy for multiplication of polynomials.  AN04.07 Identify and explain errors in a solution for a polynomial multiplication.  **AN05 Students will be expected to demonstrate an understanding of common factors and trinomial factoring, concretely, pictorially, and symbolically.**  *Performance Indicators*  AN05.01 Determine the common factors in the terms of a polynomial, and express the polynomial in factored form.  AN05.02 Model the factoring of a trinomial, concretely or pictorially, and record the process symbolically.  AN05.03 Factor a polynomial that is a difference of squares, and explain why it is a special case of trinomial factoring where b = 0.  AN05.04 Identify and explain errors in a polynomial factorization.  AN05.05 Factor a polynomial, and verify by multiplying the factors.  AN05.06 Explain, using examples, the relationship between multiplication and factoring of polynomials.  AN05.07 Generalize and explain strategies used to factor a trinomial.  AN05.08 Express a polynomial as a product of its factors. | **CHAPTER 3 – Factors and Products**  *3.1 – Factors and Multiples of Whole Numbers*  *3.2 – Perfect Squares, Perfect Cubes, and their Roots*  *3.3 – Common Factors of Polynomial*  *3.4 – Modelling Trinomials as Binomial Products*  *3.5 – Polynomials of the Form x2 + bx + c*  *3.6 – Polynomials of the Form ax2 + bx + c*  *3.7 –Multiplying Polynomials*  *3.8 – Factoring Special Polynomials*  *Assessments:*  Problem Solving Group Presentations  Journal  Practice Exercises  Quizzes  Chapter test  Project: Algebra Tiles  TIME FRAME :November 3-14, 2014  RESOURCES:  Pearson Math 10 textbook, Nelson Math 10 textbook, graphing calculator | | |
| **AN03 Students will be expected to demonstrate an understanding of powers with integral and rational exponents.**  *Performance Indicators*  AN03.01 Explain, using patterns, why  AN03.02 Explain, using patterns, why  AN03.03 Apply the following exponent laws to expressions with rational and variable bases and integral and rational exponents, and explain the reasoning.  AN03.04 Express powers with rational exponents as radicals and vice versa, when m and n are natural  numbers, and x is a rational number.  and=  AN03.05 Solve a problem that involves exponent laws or radicals.  AN03.06 Identify and correct errors in a simplification of an expression that involves powers.  AN04 Students will be expected to demonstrate an understanding of the multiplication of polynomial expressions (limited to monomials, binomials, and trinomials), concretely, pictorially, and symbolically. | **CHAPTER 4 – Roots and Powers**  *4.1 – Estimating Roots*  *4.2 – Irrational Numbers*  *4.3 – Mixed and Entire Radicals*  *4.4 – Fractional Exponents and Radicals*  *4.5 – Negative Exponents and Reciprocals*  *4.6 – Applying the Exponent Laws*  *Assessments:*  Journal  Practice Exercises  Quizzes  Chapter test  Unit test  Midterm Exam  TIME FRAME :November 18- December 5, 2014  RESOURCES:  Pearson Math 10, Nelson Math 10, graphing calculator | | |
| **Unit 3 – Relations and Functions**  **(70-75 hours)**  **General Outcome: Develop algebraic and graphical reasoning through the study of relations.** | | | |
| **CURRICLUM OUTCOMES** | | | **UNIT PLAN** |
| **RF01 Students will be expected to interpret and explain the relationships among data, graphs, and situations.**  *Performance Indicators*  RF01.01 Graph, with or without technology, a set of data, and determine the restrictions on the domain and range.  RF01.02 Explain why data points should or should not be connected on the graph for a situation.  RF01.03 Describe a possible situation for a given graph.  RF01.04 Sketch a possible graph for a given situation.  RF01.05 Determine, and express in a variety of ways, the domain and range of a graph, a set of ordered pairs, or a table of values.  **RF02 Students will be expected to demonstrate an understanding of relations and functions.**  *Performance Indicators*  RF02.01 Explain, using examples, why some relations are not functions, but all functions, are relations.  RF02.02 Determine if a set of ordered pairs represents a function.  RF02.03 Sort a set of graphs as functions or non-functions.  RF02.04 Generalize and explain rules for determining whether graphs and sets of ordered pairs represent functions.  RF03 Students will be expected to demonstrate an understanding of slope with respect to rise and  run, line segments and lines, rate of change, parallel lines, and perpendicular lines. | | | **CHAPTER 5 – RELATIONS AND FUNCTIONS**  *5.1 – Representing Relations*  *5.2 – Properties of Functions*  *5.3 – Interpreting and Sketching Graphs*  *5.4 – Graphing Data*  *5.5 – Graphs of Relations and Functions*  *5.6 – Properties of Linear Equations*  *5.7 – Interpreting Graphs of Linear Functions*  *Assessments:*  Journal  Graphing Exercises  Practice Exercises  Quizzes  Chapter test  TIME FRAME :December 8- January 23, 2015  RESOURCES:  Pearson Math 10, Nelson Math 10, graphing calculator, graphing papers |
| **RF03 Students will be expected to demonstrate an understanding of slope with respect to rise and run, line segments and lines, rate of change, parallel lines, and perpendicular lines.**  *Performance Indicators*  RF03.01 Determine the slope of a line segment by measuring or calculating the rise and run.  RF03.02 Classify lines in a given set as having positive or negative slopes.  RF03.03 Explain the meaning of the slope of a horizontal or vertical line.  RF03.04 Explain why the slope of a line can be determined by using any two points on that line.  RF03.05 Explain, using examples, slope as a rate of change.  RF03.06 Draw a line, given its slope and a point on the line.  RF03.07 Determine another point on a line, given the slope and a point on the line.  RF03.08 Generalize and apply a rule for determining whether two lines are parallel or perpendicular.  RF03.09 Solve a contextual problem involving slope.  **RF04 Students will be expected to describe and represent linear relations, using words, ordered pairs, tables of values, graphs, and equations.**  *Performance Indicators*  RF04.01 Identify independent and dependent variables in a given context.  RF04.02 Determine whether a situation represents a linear relation, and explain why or why not.  RF04.03 Determine whether a graph represents a linear relation, and explain why or why not.  RF04.04 Determine whether a table of values or a set of ordered pairs represents a linear relation, and explain why or why not.  RF04.05 Draw a graph from a set of ordered pairs within a given situation, and determine whether the relationship between the variables is linear.  RF04.06 Determine whether an equation represents a linear relation, and explain why or why not.  RF04.07 Match corresponding representations of linear relations.  **RF05 Students will be expected to determine the characteristics of the graphs of linear relations, including the intercepts, slope, domain, and range.**  *Performance Indicators*  RF05.01 Determine the intercepts of the graph of a linear relation, and state the intercepts as values or ordered pairs.  RF05.02 Determine the slope of the graph of a linear relation.  RF05.03 Determine the domain and range of the graph of a linear relation.  RF05.04 Sketch a linear relation that has one intercept, two intercepts, or an infinite number of intercepts.  RF05.05 Identify the graph that corresponds to a given slope and y-intercept.  **RF07 Students will be expected to determine the equation of a linear relation to solve problems, given a graph, a point and the slope, two points, and a point and the equation of a parallel or perpendicular line.**  *Performance Indicators*  RF07.01 Determine the slope and y-intercept of a given linear relation from its graph, and write the equation in the form y = mx + b.  RF07.02 Write the equation of a linear relation, given its slope and the coordinates of a point on the line, and explain the reasoning.  RF07.03 Write the equation of a linear relation, given the coordinates of two points on the line, and explain the reasoning.  RF07.04 Write the equation of a linear relation, given the coordinates of a point on the line and the equation of a parallel or perpendicular line, and explain the reasoning.  RF07.05 Graph linear data generated from a context, and write the equation of the resulting line.  RF07.06 Determine the equation of the line of best fit from a scatter plot using technology and determine the correlation.  RF07.07 Solve a problem, using the equation of a linear relation.  **RF08 Students will be expected to solve problems that involve the distance between two points and the midpoint of a line segment.**  *Performance Indicators*  RF08.01 Determine the distance between two points on a Cartesian plane using a variety of strategies.  RF08.02 Determine the midpoint of a line segment, given the endpoints of the segment, using a variety of strategies.  RF08.03 Determine and endpoint of a line segment, given the other endpoint and the midpoint, using a variety of strategies.  RF08.04 Solve a contextual problem involving the distance between two points or midpoint of a line segment. | | | **CHAPTER 6– LINEAR FUNCTIONS**  *6.1 – Slope of a Line*  *6.2 – Slopes of Parallel and Perpendicular Lines*  *6.3 – Investigating Graphs of Linear Functions*  *6.4 – Slope-Intercept Form of the Equation for a Linear Function*  *6.5 – Slope-Point Form of the Equation for a Linear Function*  *6.6 – General Form of the Equation for a Linear Relation*  *Assessments:*  Graphing Exercises  Journal  Practice Exercises  Quizzes  Chapter test  TIME FRAME : January 19 - March 27, 2015  RESOURCES:  Pearson Math 10 textbook, Nelson Math 10 textbook, graphing calculator |
| **RF09 Students will be expected to represent a linear function, using function notation.**  *Performance Indicators*  RF09.01 Express the equation of a linear function in two variables, using function notation.  RF09.02 Express an equation given in function notation as a linear function in two variables.  RF09.03 Determine the related range value, given a domain value for a linear function.  RF09.04 Determine the related domain value, given a range value for a linear function.  RF09.05 Sketch the graph of a linear function expressed in function notation.  **RF10 Students will be expected to solve problems that involve systems of linear equations in two variables, graphically and algebraically.**  *Performance Indicators*  RF10.01 Model a situation, using a system of linear equations.  RF10.02 Relate a system of linear equations to the context of a problem.  RF10.03 Determine and verify the solution of a system of linear equations graphically, with and without technology.  RF10.04 Explain the meaning of the point of intersection of a system of linear equations.  RF10.05 Determine and verify the solution of a system of linear equations algebraically.  RF10.06 Explain, using examples, why a system of equations may have no solution, one solution, or an infinite number of solutions.  RF10.07 Explain a strategy to solve a system of linear equations.  RF10.08 Solve a problem that involves a system of linear equations. | | | **CHAPTER 7– SYSTEMS OF LINEAR EQUATIONS**  *7.1 – Developing Systems of Linear Equations*  *7.2 – Solving a System of Linear Equations Graphically*  *7.3 – Using Graphing Technology to Solve a System*  *7.4 – Using a Substitution Strategy to Solve a System of Linear Equations*  *7.5 – Using a Elimination Strategy to Solve a System of Linear Equations*  *7.6 – Properties of Systems of Linear Equations*  *Assessments:*  Measuring Solid Figures Activity  Scavenger Hunt Activity  Practice Exercises  Quizzes  Chapter tests  Unit test  Project: Graph Posters  *Activities:*  Math Fun Day  TIME FRAME : March 30 - May 1, 2015  RESOURCES: Pearson Math 10 textbook, Nelson Math 10 textbook, graphing calculator |
| **Unit 4 – Financial Mathematics**  **(40-45 hours)**  **General Outcome: Demonstrate number sense and critical thinking skills.** | | | |
| **CURRICULUM OUTCOMES** | **UNIT PLAN** | | |
| **FM01 Students will be expected to solve problems that involve unit pricing and currency exchange, using proportional reasoning.**  *Performance Indicators*  FM01.01 Compare the unit price of two or more given items.  FM01.02 Solve problems that involve determining the best buy, and explain the choice in terms of the cost as well as other factors, such as quality and quantity.  FM01.03 Compare, using examples, different sales promotion techniques.  FM01.04 Determine the percent increase or decrease for a given original and new price.  FM01.05 Solve, using proportional reasoning, a contextual problem that involves currency exchange.  FM01.06 Explain the difference between the selling rate and purchasing rate for currency exchange.  FM01.07 Explain how to estimate the cost of items in Canadian currency while in a foreign country, and explain why this may be important.  FM01.08 Convert between Canadian currency and foreign currencies, using formulas, charts, or tables.  **FM02 Students will be expected to demonstrate an understanding of income to calculate gross pay and net pay, including wages, salary, contracts, commissions, and piecework.**  *Performance Indicators*  FM02.01 Describe, using examples, various methods of earning income.  FM02.02 Identify and list jobs that commonly use different methods of earning income (e.g., hourly wage, wage and tips, salary, commission, contract, bonus, shift premiums).  FM02.03 Determine in decimal form, from a time schedule, the total time worked in hours and minutes, including time and a half and/or double time.  FM02.04 Determine gross pay from given or calculated hours worked when given the base hourly wage, with and without tips the base hourly wage, plus overtime (time and a half, double time)  FM02.05 Determine gross pay for earnings acquired by base wage, plus commission single commission rate  FM02.06 Explain why gross pay and net pay are not the same.  FM02.07 Determine the Canadian Pension Plan (CPP), Employment Insurance (EI), and income tax deductions for a given gross pay.  FM02.08 Determine net pay when given deductions (e.g., health plans, uniforms, union dues, charitable donations, payroll tax).  FM02.09 Investigate, with technology, “what if …” questions related to changes in income (e.g., What if there is a change in the rate of pay?)  **FM03 Students will be expected to investigate personal budgets.**  *Performance Indicators*  FM03.01 Identify income and expenses that should be included in a personal budget.  FM03.02 Explain considerations that must be made when developing a budget (e.g., prioritizing, and recurring and unexpected expenses).  FM03.03 Create a personal budget based on given income and expense data.  FM03.04 Collect income and expense data, and create a budget.  FM03.05 Modify a budget to achieve a set of personal goals.  FM03.06 Investigate and analyze, with or without technology, “what if …” questions related to personal budgets.  **FM04 Students will be expected to explore and give a presentation on an area of interest that involves financial mathematics.**  *Performance Indicators*  FM04.01 Collect primary or secondary data (statistical or informational) related to the topic.  FM04.02 Organize and present a project.  FM04.03 Create and solve a contextual problem that is related to the project.  FM04.04 Make informed decisions and plans related to the project.  FM04.05 Compare advantages and disadvantages as part of the project. | **FINANCIAL MATHEMTICS**  *FM. 1 – Unit Pricing*  *FM. 2 – Currency Exchange*  *FM. 3 – Wages and Salary*  *FM. 4 – Net Pay*  *FM. 5 – Other Forms of Income*  *FM.6 – Budgets*  *Assessments:*  Journal  Practice Exercises  Quizzes  Unit Test  Provincial Exam  *Activities:*  Math Career Day  Project: Business Expo 4.0  TIME FRAME : May 4- June 5, 2015  RESOURCES:  Pearson Math 10 textbook , Nelson Math 10 textbook , McGrawHill Financial Mathematics textbook, calculators, Canadian tax information | | |
| **IMPORTANT DATES:**  November 21 – Q1 Report Card  January 12-15 – Midterm Exam  January 20 – Midterm Report Card  April 10 – Q3 Report Card  June 15-18 – Final Exam  June 22 – Final Report Card  June 25 – Graduation Day | | | |