

CURRICULUM SUMMARY – September to October 2010

SUBJECT: Mathematics

YEAR GROUP: 7

TEACHER: FN

Week	Learning objectives	Activities (in brief)
1	Unit 5: (5.1, 5.2, 5.3, 5.4, 5.5) <ul style="list-style-type: none"> - Multiplication unto 12 x 12 - Multiples - Squares, square roots and cubes - Factors and prime Numbers 	<ul style="list-style-type: none"> - Review the times table - Exercise 5B, 5C, 5D, 5E <p style="text-align: center;">Homework : 5.1 and 5.2</p>
2	Unit 5 - 5.6, 5.7, 5.8, 5.9 <ul style="list-style-type: none"> - Multiplying by 10, 100, 1000 - Dividing by 10, 100, 1000 - Multiplying by multiples of 10, 100, 1000 - Multiplication and Division problems - Long division and multiplication 	<ul style="list-style-type: none"> - Review last weeks topics and completion of homework - Exercise 5F, 5G, 5H, 5I, 5J <p style="text-align: center;">Homework: 5.3 and 5.4</p>
3	Unit 5 - 5.10, 5.11, 5.12, 5.13, 5.14 <ul style="list-style-type: none"> - Half way between - Multiplying 3-digit numbers by a 2-digit number - Dividing a 3 digit number by a 2 digit - -Power of whole numbers 	<ul style="list-style-type: none"> - Review last week's topics and completion of homework - Exercise K, L, M, N, O <p style="text-align: center;">Homework: 5.5 and 5.6</p>
4	Unit 2 – 2.1,2.2,2.3,2.4,2.5 <ul style="list-style-type: none"> - Digits and place value - Reading Large Numbers - Order - Ordering large numbers - Mental Maths 	<ul style="list-style-type: none"> - End of Unit Test - Exercise 2A, 2B, 2C, 2D, 2E <p style="text-align: center;">Homework: 2.1 and 2.2</p>
5	Unit 2: 2.6, 2.7, 2.8, 2.9, 2.10, 2.11 <ul style="list-style-type: none"> - Mental maths with 10s - Mental Maths: adding 2 digits - Mental Maths: adding 2 digits to a 3 digit number - Mental Maths: Subtracting 2-digits - Mental Maths: subtracting 2 digits from a 	<ul style="list-style-type: none"> - Review last week's topics and completion of homework - Exercise 2F, 2G, 2H, 2I, 2J, 2K <p style="text-align: center;">Homework: 2.3</p>

	3 digit number	
6	Unit 2: 2.12, 2.13, 2.14, 2.15, 2.16 - Using mental maths to solve problems - Greater or less than - To the nearest - Adding numbers on paper - Subtracting numbers on paper	- Review last week's topics and completion of homework - Exercise 2L, 2M, 2N, 2O, 2P, 2Q Homework: 2.4 and 2.5
7	Unit 2: 2.17, 2.18, 2.19 - Rounding to the nearest 10 - Rounding to the nearest 100 and 1000 - Checking answer by estimating	- Review last week's topics and completion of homework - Exercise 2R, 2S, 2T End of Unit Test

SUBJECT: Mathematics

YEAR GROUP: Year 8

TEACHER: Anna Tokarz

Week	Learning objectives	Activities (in brief)
1	Understand and apply terms: factor, multiple, prime number, composite number, Highest Common Factor (HCF) and Least Common Multiple (LCM).	The Sieve of Eratosthenes. Math games: prime numbers. Constructing factor trees. Representing prime factors of two numbers using Venn Diagrams. Using prime factorization to find HCF and LCM of two numbers.
2	Evaluate powers and roots of numbers. Evaluate formulae using order of operations. Round whole numbers to the given number of significant figures.	Using scientific calculators efficiently. Estimating values of expressions. Review of long multiplication and division of whole numbers.
3	Order integers. Represent integers on a number line. Add and subtract integers in context. Add and subtract integers using algebra rules.	Adding and subtracting integers using a number line. Adding and subtracting integers using the real life context e.g. temperature, banking. Extensive practice of adding and subtracting integers.
4	Multiply and divide integers. Evaluate arithmetic expressions involving complex manipulations of integers.	Discovering rules for multiplication and division of integers. Review of the order of operations in the context of integers. Extensive practice of manipulating integers.
5	Continue a shape pattern and a number pattern. Complete number machines. Use inverse operations. Find the nth term of a sequence.	Creating patterns. Investigating the rules for the nth term of a sequence.

6	Draw, estimate and measure angles (acute, obtuse and reflex) Find values of missing angles on a line, at a point, in a triangle and in a quadrilateral. Find angles in polygons. Find values of angles between parallel lines.	Using a protractor accurately. Proving that the theorems about the sum of interior angles in a triangle and in a quadrilateral (informal) Investigating rules for measures of angles between parallel lines.
7	Retain the skills acquired.	Review of miscellaneous problems. Solving SAT type of problems.

SUBJECT: Mathematics

YEAR GROUP: Year 9

TEACHER: Anna Tokarz

Week	Learning objectives	Activities (in brief)
1	Know and use index laws for multiplication, division and raising power to another power; extend understanding of index notation to negative and fractional powers, extend knowledge to integer powers of 10.	Investigation on laws of indices and establishing the rules.
2	Write numbers in scientific notation; add, subtract, multiply and divide numbers in scientific notation on paper and using a calculator; use prefixes centi, kilo, nano, mega etc. ; understand upper and lower bounds.	Using a scientific calculator efficiently. Application in science problems and texts.
3	Use index notation and index laws in algebra; simplify or transform algebraic expressions; collect like terms; add , subtract, multiply and divide simple algebraic fractions.	Review of calculations with fractions in order to establish the rules for manipulating algebraic fractions.
4	Expand the product of two linear expressions; square a linear expression and simplify the corresponding quadratic expression, establish algebraic identities; apply algebraic identities to expand expressions.	Using diagrams to multiply linear expressions. Using the mnemonic FOIL to multiply linear expressions. Algebraic identities: $(a \pm b)^2 = a^2 \pm 2ab + b^2$ and $(a + b)(a - b) = a^2 - b^2$.
5	Apply algebraic identities to factor expressions; factor quadratics with the leading coefficient of 1	Investigating rules for factorizing quadratics.
6	Construct and solve linear equations with	Solving and creating puzzles "I think of a number..."

	integer coefficients (with and without brackets, negative signs anywhere in the equation, positive or negative solutions) using an appropriate method.	Review of calculations with negative numbers in order to apply in solving equations.
7	Apply linear equations to solve real life problems; use formulae from mathematics and science to create and solve linear equations; understand and use measures of speed and other compound measures such as density or pressure to solve problems.	Solving problems involving money, age, speed-distance-time. Review of known math geometry formulae .

SUBJECT: Mathematics

YEAR GROUP: Year 10

TEACHER: Anna Tokarz

Week	Learning objectives	Activities (in brief)
1	Use the concept and vocabulary of factor, multiple, common factor, highest common factor, least common multiple, prime number and prime factor decomposition; understand reciprocal as multiplicative inverse .	Book 1, chapter 2 Solving past paper problems.
2	Round integers to the given power of 10; find minimum and maximum values; understand equivalent fractions; simplify fractions; order fractions; add, subtract, multiply and divide fractions; multiply and divide decimals,; order decimals; recognize that terminating and recurring decimals are exact fractions; convert between fractions and decimals; convert a recurring decimal to a fraction.	Book 1, chapters 3, 5, 7 Solving past paper problems.
3	Use the terms square, positive square root, negative square root, cube and cube root; use index notation and index laws for multiplication and division of integer powers; use standard index form; use index laws to simplify and calculate the value of numerical expressions.	Book 1, chapter 12 Using standard index notation expressed in conventional way and on calculator display Solving past paper problems.
4	Use fractional and negative powers; simplify surds; rationalize the denominator of a surd .	Book 1, chapters 12, 8 Solving past paper problems.

5	Expand the product of two linear expressions; collect like terms; multiply out brackets; take out common factors; factor simple quadratic expressions.	Book 1, chapter 4 Solving past paper problems.
6	Factor quadratic expressions; simplify rational expressions.	Book 1, chapter 4 Solving past paper problems.
7	Calculate mean, median, mode and range for a frequency table; calculate mean, median, mode and range for a grouped frequency table.	Book 1, chapter 1 Solving past paper problems.

SUBJECT: Mathematics

YEAR GROUP: Year 11

TEACHER: Anna Tokarz

Week	Learning objectives	Activities (in brief)
1	Recall the definition of a circle and the related terms: center, radius, chord, diameter, circumference, tangent, arc, sector, segment; understand and use properties of tangents, chords and angles in a circle.	Book 2, chapter 1 Solving past paper problems.
2	Solve equations using trial and improvement methods. Solve compound measure problems: speed, density. Find the upper and lower bounds for calculations.	Book 2, chapters 2 and 4. Showing the working in the format of a table. Application of maths in science. Solving past paper problems.
3	Use real –life graphs. Calculate average speed from distance-time graphs. Interpret velocity-time graphs. Discuss and interpret graphs modeling real situations.	Book 2, chapter 5. Interpreting graphs and representing data using graphs. Application of maths in science. Solving past paper problems.
4	Evaluate formulae. Use formulae to form and solve an equation. Rearrange formulae.	Book 2, chapter 6. Review of solving linear equations. Review of order of operations. Review of inverse operations. Solving past paper problems.

5	<p>Draw graphs of straight lines given equation. Write equation of a straight line given its graph. Explore gradients of parallel and perpendicular lines.</p>	<p>Book 2, chapter 10. Investigating correlation between graphs and equations of straight lines. Investigating rules for equations of parallel and perpendicular lines. Solving past paper problems.</p>
6	<p>Draw graphs of quadratic functions. Find points of intersection of quadratic graphs with lines. Use graphs to find approximate solutions of quadratic equations.</p>	<p>Book 2, chapter 13. Drawing accurate graphs of quadratics using templates. Solving equations graphically. Solving past paper problems.</p>
7	<p>Solve quadratic equations by factorization. Solve quadratic equations using the quadratic formula. Complete the square for quadratics. Use completed the square form to find coordinates of a vertex, minimum or maximum values of a quadratic.</p>	<p>Book 2, chapter 14. Factorizing quadratics by splitting the middle term. Solving quadratic equations using an appropriate method. Solving past paper problems.</p>

SUBJECT: Mathematics SL

YEAR GROUP: IB1

TEACHER: Agata Piskorz

Week	Learning objectives	Activities (in brief)
1	<p>Students will understand a nature of the subject and the IB assessment outline. EXPONENTS AND LOGARITHMS Students will understand and use:</p> <ul style="list-style-type: none"> • surds, • exponents, index notation; • laws of exponents; 	<p>teacher's explanations; discussion;</p> <p>calculations with surds defining exponents with negative and rational indices and using them, using laws of exponents - calculations</p>
2	<ul style="list-style-type: none"> • logarithms • laws of logarithms including change of base • exponential equations • revision 	<p>Defining logarithms in any base and base 10, finding logarithms with a calculator and without it, discovering the laws of logarithms using laws of logarithms, solving exponential equations – using logarithms revision – solving problems at class and at home; writing a test; discussing results of the test;</p>

3	<p>SEQUENCES AND SERIES</p> <p>Students will understand and use:</p> <ul style="list-style-type: none"> definition of a sequence, the general term (n-th term) of a sequence, definition of arithmetic and geometric sequences, the formula for the n-th term of an arithmetic sequence, the formula for the n-th term of a geometric sequence 	<p>Generating terms of a sequence using term-to-term and position-to-term definitions of the sequence.</p> <p>Specifying sequences by using words, using an explicit formula (general term – n-th term formula).</p> <p>Showing that a sequence is arithmetic.</p> <p>Showing that a sequence is geometric.</p> <p>Finding the formula for the general term of an arithmetic or geometric sequence.</p>
4	<ul style="list-style-type: none"> the sum of an arithmetic sequence -arithmetic series, the formula for the sum of the first n terms, the sum of a geometric sequence, geometric series, the sum of an infinite geometric series, examples of applications: compound interest and population growth, 	<p>Using sigma notation</p> <p>Finding sums of the arithmetic and geometric series.</p> <p>Solving growth and decay problems.</p> <p>Using the compound interest formula $I = C\left(1 + \frac{r}{k \times 100}\right)^{n \times k} - C$ and using the <i>PTM SOLVER</i> on the graphics calculator to find compound interest</p>
5	<ul style="list-style-type: none"> revision <p>THE BINOMIAL THEOREM</p> <p>Students will understand and use:</p> <ul style="list-style-type: none"> expansion of $(a + b)^n$, $n = 1, 2, 3, 4, 5, 6$. 	<p>Solving past papers questions</p> <p>Solving Review Sets from the book.</p> <p>Writing a test.</p> <p>Discussing results of the test.</p> <p>Drawing the Pascal triangle of coefficients.</p> <p>Using the binomial expansions in</p>
6	<ul style="list-style-type: none"> expansion of $(a + b)^n$, $n \in N$. 	<p>Determining the $\binom{n}{k}$ by Pascal's triangle and by the use of the GDC.</p>
7	<ul style="list-style-type: none"> revision 	<p>Solving past papers questions</p> <p>Solving Review Sets from the book.</p> <p>Writing a test.</p> <p>Discussing results of the test.</p>

SUBJECT: Mathematics HL

YEAR GROUP: IB 1

TEACHER: Anna Tokarz

Week	Learning objectives	Activities (in brief)
1	Relations and functions; use interval	Review of Background Knowledge.

	notations; describe domain and range of a function given graphically; describe x and y-intercepts of a function given graphically or algebraically; use function notation.	Using vertical line test to determine if a given relation is a function. Application of functions in solving real life problems.
2	Focus on linear functions; composite functions, inverse functions; identity function; decomposition of composite functions; use a graphing calculator to graph functions, solve equations and simultaneous equations; sequences and series; arithmetic sequence.	Review of background knowledge: solving linear equations and inequalities, rearranging formulas, solving simultaneous equations, equation of a straight line, parallel lines, perpendicular lines. Finding inverse of a function given algebraically or graphically. Activities to learn how to use a graphing calculator effectively.
3	Geometric sequence; compound interest; arithmetic series; geometric series; sum to infinity of a geometric series; Σ notation	Review of simple laws of exponents, solving rational equations and quadratic equations. Solving past paper problems. Link to arithmetic mean and geometric mean. Exercises in using appropriate formulas efficiently. Solving past paper problems.
4	Index laws; rational indices; use laws of indices to simplify expressions; algebraic expansion and factorization; solve exponential equations using laws of exponents.	Review of manipulating surds, algebraic expansion and factorization, and solving quadratic equations. Extensive practice on manipulating exponents. Solving past paper problems.
5	Graphs and properties of exponential functions; exponential growth and decay; irrational number e .	Using a graphing calculator to graph and investigate properties of exponential function. Application of exponential functions in solving science problems and modeling. Investigate the number e . Solving past paper problems.
6	Definition of a logarithm; logarithms in base 10; natural logarithms; know and apply laws of logarithms to transform logarithmic expressions.	Extensive practice on applying laws of logs. Solving past paper problems.
7	Solve exponential equations using logarithms; graphs and properties of logarithmic functions	Link to inverse functions. Practice in efficient use of a calculator. Solving past paper problems.

SUBJECT: Mathematical Studies SL

YEAR GROUP: IB2

TEACHER: Agata Piskorz

Week	Learning objectives	Activities (in brief)
1	PROJECT Students will understand the nature of the	teacher's explanations; brainstorming activity;

	<p>project, its purposes, objectives ; examples of titles of successful projects.</p> <p>PROBABILITY Students will understand and use:</p> <ul style="list-style-type: none"> • an experiment in probability; trial; outcomes; frequency and relative frequency of an outcome; 	<p>discussion;</p> <p>solving problems – finding relative frequencies; students' homework;</p>
2	<p>PROJECT Students will know how the project is assessed</p> <p>PROBABILITY Students will understand and use:</p> <ul style="list-style-type: none"> • chance investigation; sample space; event; theoretical probability of an event; • basic concepts of set theory – revision 	<p>discussing strategies required by students and the assessment criteria for a project; marking a project – homework;</p> <p>estimating probability from data – solving problems; investigation - dice rolling experiments; introducing theoretical probability; finding a connection between the experimental and theoretical probabilities – discussion; students' homework;</p>
3	<ul style="list-style-type: none"> • complementary events and their probabilities; • probabilities from Venn diagrams • compound events; independent events; 	<p>teacher's presentation of new definitions, theorems and algorithms; calculating probabilities – individual or group work;</p>
4	<p>PROJECT Students will choose a topic of the project</p> <p>PROBABILITY Students will understand and use:</p> <ul style="list-style-type: none"> • dependent events; • tree diagrams; • mutually exclusive events; laws of probability; • conditional probability; conditional probability with Venn diagrams; 	<p>Class discussion concerning students' possible choices of projects' topics; Individual discussions with students. Completing the Initial Planning – Form A</p> <p>calculating probabilities - using tree diagrams or Venn diagrams ; students' homework; finding out and using the two approaches to the conditional probability;</p>
5	<ul style="list-style-type: none"> • conditional probability with tree diagrams. • probability revision 	<p>calculating probabilities – individual or group work; revision – solving problems at class and at home; writing a test; discussing results of the test;</p>
6	<p>FUNCTIONS. TRIGONOMETRIC FUNCTIONS</p> <ul style="list-style-type: none"> • recognize and identify horizontal and vertical asymptotes of $y = \frac{1}{x + c}$ • combinations of some simple, unfamiliar 	<p>using GDC (Graphic Display Calculator) to sketch and analyze some simple unfamiliar functions; using DGC to solve equations involving simple combinations of some simple, unfamiliar functions; discussing periodic phenomena in the real world;</p> <p>students' homework;</p>

	<p>functions; (Examples: $x - 2 = \frac{1}{x}$, $5x = 3^x$)</p> <p>periodic behavior; periodic functions. maximum and minimum point; amplitude; period;</p>	
7	<ul style="list-style-type: none"> graphs and properties of the sin and cosine functions; the families: $y = A \sin x$, $y = A \cos x$; the families: $y = \sin Bx$, $y = \cos Bx$; the families: $y = \sin x + C$, $y = \cos x + C$; functions: $y = A \sin(Bx) + C$, $y = A \cos(Bx) + C$; 	<p>Using GDC to sketch and analyze graphs of the trigonometric functions; drawing graphs of trigonometric functions after certain transformations;</p> <p>students' homework; solving problems;</p>
	<ul style="list-style-type: none"> modeling using sin and cosine functions; equations involving sin and cosine. revision 	<p>Investigation – mean monthly temperature modeling; using DGC to solve equations involving trigonometric functions; revision – solving problems at class and at home; writing a test; discussing results of the test;</p>

SUBJECT: Mathematics HL

YEAR GROUP: IB 2

TEACHER: Anna Tokarz

Week	Learning objectives	Activities (in brief)
1	Derivatives of exponential and logarithmic functions. The chain rule. The product and the quotient rules.	<p>Review of laws of exponents and logarithms.</p> <p>Review of graphs and properties of exponential and logarithmic functions.</p> <p>Review of solving exponential and logarithmic equations.</p> <p>Application in solving optimization problems, finding tangents and normals to curves and motion problems.</p> <p>Solving past paper problems.</p>
2	Differential calculus of rational functions. Implicit differentiation. Related rates of change.	<p>Review of graphs and properties of rational functions.</p> <p>Solving past paper problems.</p>
3	Integrating e^{ax+b} and $(ax+b)^n$. Integration by substitution. Integration by parts. Separable differential equations.	<p>Solving past paper problems.</p>
4	Internal Assessment Type 1.	<p>Brain storm and discussion of ideas.</p> <p>Completing IA activities.</p>
5	The unit circle. Definition of sine and cosine functions in terms of a unit circle. Angle identities: negative angle, complementary	<p>Completing the unit circle.</p> <p>Mnemonics to remember signs of trig ratios: All Silver Tea Cups.</p> <p>Using the unit circle to find special angles.</p>

	angle, compound angle, double angle.	Solving past paper problems.
6	Simplifying trig identities. Solving trig equations algebraically.	Extensive practice on using trig identities and solving equations. Solving past paper problems.
7	The cosine rule. The sine rule. Application of the rules.	Exercises on solving triangles. Solving past paper problems.