WOLMER'S BOYS' SCHOOL

Department of Mathematics

Third Form

Subject: Mathematics

Course Outline 2023-2024

RATIONALE:

The framework of the Grade 9 (Third Form) Mathematics curriculum outlines the guiding principles of mathematics which focuses on:

- Reinforcing basic numeracy and operational skills developed in Grades 1-8.
- Building a solid foundation in order to acquire a range of mathematical techniques and skills.
- Stimulating and generating interest through the application of simple and meaningful problems reflected through everyday experiences.
- Developing the ability to reason, think logically and creatively.
- Learning through discovery by engaging in mathematical problem solving and investigations.
- Developing a deeper understanding and application of the mathematical concepts and skills and to transfer knowledge and relate skills in other subject areas.

- Gearing students to be successful in learning higher order concepts relevant to the C.X.C. – CSEC curriculum and final examination.

- Continuous revision and practice to fully prepare students for further mathematical learning.

CHRISTMAS TERM:

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
1 Sep 5 -9	Number Theory	**Revision of:** Fractions, Decimals Percentages, Sequences, rounding off numbers **Writing Numbers in:** Decimal Places, Significant Figures and Standard Form. Mathematical properties a.) Identify and use the following concepts: - Closure;		Discussion: What do we remember about each topic? How can we relate each topic to real life? Cooperative learning: In teams students should be able to complete assigned sections of the assigned activity sheet.	Online Resources: https://www.mathsisfun.com/numbers/index.html Student self-assessment: https://www.transum.org	Complete the individual section of the given activity. 1st Graded Classwork Sept (14 – 16)

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
		- Reflexive property; - Symmetry property; - Transitive property; - Trichotomy Law				

2 Sept 12- 16	Algebra	The Distributive Property a) Use of the Distributive Property to simplify expressions including laws of Indices(e.g. Cases such as ; $a(x+y)$, $x^2(ax-y)$ etc.) b) Use of the distributive property to multiply two binomial expressions (e.g. $(ax+b)(bx+c)$) c) Review Binary Operations		Role Play: The Delivery Man-Students will be given a scenario to act out Discussion: What have you learnt form the role play? What principles of distribution did we learn? What do we remember about Binary Operation? Cooperative Learning: As a team student will create a problem-solving question involving disruptive property and binary operation.	Explain: Students will be asked to create a video that will explain the concept of distribution and post on www.blogger.com Online Resources: https://www.mathsisfun.com/associative-commutative-distributive.html http://www.montereyinstitute.org/courses/DevelopmentalMath Self-Assessment: https://www.transum.org/software/SW/Starter_of_the_day/Students/Brackets.asp?Level=9	Complete Level 9 on transum.org and attach proof of score. 2nd Graded Homework Sept (28-30)
3 Sept 19- 23	Algebra	**Operations on Algebraic Expressions** a) Add and Subtract simple algebraic expressions. b) Multiplication and division of simple algebraic fractions **c) Operations on Simple Algebraic Fractions** **Factorization of AlgebraicExpressions**	Add, Subtract, Multiply and Divide Fractional Expressions.	Demonstration and Collaboration	Online Resources: https://byjus.com/maths/factorisation-of-algebraic-expression/#:~:text=A%20number%20or%20quantity%20that,%2C%204%2C%206%20and%2012.&text=This%20expression%20consists%20of%203,%7B2%7D%20and%20%2Dyz. Use online algebra tiles to explain the concept of factorization https://support.mathies.ca/en/mainSpace/AlgebraTiles.php	Students will be placed in groups of 5 and will be asked to complete a given worksheet.

		Simple factorization				
4 Sept 26- 28	Algebra	**Algebraic Equations** **a)** Revise solving simple Algebraic equations b) Solve algebraic equations with fractional terms **Simultaneous Equations** a) Solving simultaneous linear equations using the elimination and substitution methods. Include worded problems.		Guided Discovery: The use of addition, subtraction, multiplication and division of simple fractions to explain the algebraic equations with fractional terms. Demonstration and Collaboration to solve and explain simultaneous equation using both the substitution and elimination method.	PowerPoint presentation to do in class activity. Online Recourses: https://www.bbc.co.uk/bitesize/guides/z9y9jty/revision/1 https://revisionmaths.com/gcse-maths-revision/algebra/simultaneous-equations Student self-Assessment: https://quizizz.com/quiz	Comprehensive worksheet Complete the exam stulelevel questions from transum.org which will be linked in google classroom.
5 Oct 3-7	Geometry	**Pythagoras' Theorem** a) Prove Pythagoras' Theorem by a suitable method. b) Determining the lengths of unknown sides of a right-angled triangle using Pythagoras' Theorem.		Guided Discovery Demonstration and Collaboration	Online Resources: https://www.mathsisfun.com/pythagoras.html	Complete a quiz from quizzes.com which will be imbedded on their google classroom. 3rd Graded Classwork Oct (5 – 7)
6 Oct	Geometry	**The Trigonometric Ratios** a) Use of scientific calculators Using trigonometric ratios		Collaboration	Online resources: https://www.khanacademy.org/math/geom	Group Activity where students are expected to come up with a slogon, song, poem, or any other

10-12		(Sin, Cos and Tan) to determine the lengths of unknown sides and size of unknown angles in a right angled triangle. b) Using trigonometric ratios to solve problems relating to angles of elevation and depression c) Calculate the size of unknown angles from given diagrams and worded problems using a combination of Trigonometric ratios and Pythagoras' Theorem.			etry/hs-geo-trig/hs-geo-trig-ratios-intro/a/finding-trig-ratios-in-right-triangles Interactive PowerPoint for explanation and clear working of questions	creative method in which they can remember the different trig ratios and when to use them. Complete a given worksheet.
7 Oct 18-21	Number Theory	Indices a) State the meaning of a^m, where ***a*** and ***m*** are **rational numbers** b) Simplifying expressions using the laws of indices. c) Evaluating expressions of the form a^m and $a^m \times b^n$ where ***a, b, m*** **and *n*** are whole numbers, fractions and Integers.e.g. Cases such as ; $9^{\frac{1}{2}} \times 9^{\frac{1}{2}}$,		Collaboration	In assigned groups students should be able to create an interactive PowerPoint to explain the law of indices assigned. Online Resources:https://www.bbc.co.uk/bitesize/guides/zpmyrwx/revision/1#:~:text=The%20laws%20of%20indices%20enable,number%20or%20letter%20has%20been Game of Jeopardy imbedded in an interactive PowerPoint to test students understanding	Individual Worksheet 4th Graded Homework Oct (19-21)

		$4^{\frac{3}{2}}$, $27^{\frac{4}{3}}$ d) Solve Power Equations in one term				
8 Oct 24-28	Measure - ment	**Circles and Sectors** a) Investigation and use of the relationships among the radius, diameter, pi, circumference and area of a circle and identifying the arc, sector and segment of a circle. b) Calculation of the area and circumference of a circle. Derive Formula for area of trapezium and parallelogram	Uncovered second form topic (2020- 2021)	Discussion: What do we remember about the circle?	Online resources: https://www.mathsisfun.com/geometry/circle.html Guided Discovery: In groups students should be able to create a short video demonstrating and explaining how to derive the assigned formulas.	Students will be assessed on their group video. Individual practice from transum.com 5th Test Oct (26-28)
9 Oct 31-Nov4	Measure - ment	a) Calculation of the area of a sector, segments or parts thereof of circle with use of angles.		Demonstration, collaboration and Guided Discovery. Students should be able to see the area of a sector as a fraction of the area of a circle and from that should be guided to derive the formula for the area of a sector.	Online Resources: https://www.onlinemathlearning.com/area-sector.html#:~:text=Area%20of%20Sector,-A%20sector%20is&text=It%20consists%20of%20a%20region,the%20area%20of%20the%20sector. Guided Discovery: In groups students should be able to create a short video demonstrating and explaining how to derive the assigned formulas.	Students will be assessed on their group video. Individual practice from transum.com

					Use of Gegogebra to solve in class activities Class practice: https://www.transum.org/software/SW/Starter_of_the_day/Students/Circles.asp?Level=6	6th October 31–Nov 1 Home work (online quiz)
10 Nov 7-11	Measure -ment	b) Calculation of Arc length and perimeter of a sector		Demonstration, collaboration and Guided Discovery. Students should be able to see the arc length of a sector as a fraction of the circumference of a circle and from that should be guided to derive the formula for the arc length of a sector	Use of Geogebra to solve class activities Class practice:https://www.transum.org/Software/SW/Starter_of_the_day/Similar.asp?ID_Topic=55	Students will be assessed on their group video. Individual practice from transum.com
11 Nov 14-18						Students will be asked to complete a quize from quizzes.com which will be linked to their google classroom.

12 Nov 21 -25		Revision				Revision
13 Nov 28 –Dec 9						EOT Examination
15	Christmas Holiday					

Easter Term

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
16 Jan 09 - 13	Algebra	**Functions and Relations** a) Define a function as a many-to-one or one-to-one relation. b) Distinguish between the graph of a relation and the graph of a function. c) Use the functional notations, for example $f : x \to 2x+1$, $f(x) = 2x+1$, $y = f(x)$		Discussion and Role Play: Students should be able to create a poem, song, a dup or any other musical presentation to explain the concept of relations in real life. With the use of DESMO via observation and discussion students should be able to tell the difference between the graph of a function and a relation.	Online Resources: https://byjus.com/maths/relations-and-functions/#:~:text=An%20ordered%20pair%20is%20represented,not%20all%20relations%20are%20functions. https://www.vedantu.com/revision-notes/cbse-class-12-maths-notes-chapter-1-relations-and-functions In class Practice: https://www.transum.org/Maths/Exercise/Functions.asp	

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17 JAN 16 - 20		d) Determine the range value that corresponds to a given domain value by evaluating the function at the stated domain value. e) State the domain and range of a given function f) Distinguish between functions defined for different domains by the same formula			https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/cc-8th-function-intro/v/relations-and-functions Use of DESMOS to plot and explain the graphs	

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18 Jan 23-27	Algebra	**Quadratics** a) Introduction to quadratic equations c) Write a quadratic mapping as a set of ordered pairs	*Teachers may explore the characteristics of the Graphs of* $f(x) = x^2$ and $f(x) = -x^2$	Collaboration and presentation	Online Resources: http://dl.uncw.edu/digilib/Mathematics/Algebra/mat111hb/PandR/quadratic/quadratic.html#:~:text=A%20quadratic%20function%20is%20one,same%20basic%20%22U%22%20shape. Use of interactive PowerPoint presentation	
19 Jan 30- Feb 03	Algebra	d) Plot the ordered pairs of a quadratic mapping as a graph. e) Interpret the point(s) of intersection of a quadratic graph with the axes.		Demonstration and collaboration With the use of DESMOS teacher will demonstrate the plotting of the quadratic graph with assistance and collaboration from students.	In class practice: https://www.transum.org/Maths/Exam/Online_Exercise.asp?Topic=Quadratic%20Graphs Use of DESMOS to plot quadratic graphs	Group Activity

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		f) Relate the solution to a quadratic equation to the point(s) of intersection between a quadratic curve and the ***x - axis*** graph. **Kinematics** -speed time graph -distance time graphs **Vectors** a) Define a vector as the sum total of horizontal and vertical displacement. b) Write vectors in column format. c) Define position vectors given two points d) Use grid to locate and draw, position and relative position vectors		Use of Class-size grid to demonstrate how we locate and draw vectors.	Online resources and practice: https://www.khanacademy.org/math/algebra-home/alg-vectors https://www.transum.org/Maths/Exam/Online_Exercise.asp?Topic=Vectors video presentation: https://www.youtube.com/watch?v=xYhX29gBybE	
20 Feb 06-10	Algebra	e) Draw a right-angled triangle representing a vector f) Use Pythagoras' theorem to find the length of a vector g) Write the reverse vector (- x) given a vector x		Demonstration and collaboration	Resources: https://www.easyelimu.com/high-school-notes/maths/item/1828-vectors YouTubevideo:https://www.youtube.com/watch?v=5ptH2Xw4DZc	Group Activity 1st graded CW (January 23-27)

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		(multiply a vector by -1) h) Find the relative position vector of collinear vectors given a ratio of division i) Use the properties of an appropriate polygon to find the relative position vector of parallel, non-collinear vectors				2nd HW (January 23-27)
21 Feb 13 - 17	Consumer Arithmetic	**Utilities, Wages and Salaries** a) Use consumer arithmetic to solve real life problems. b) Calculate the total utility bill to be paid from given instructions. c) Explain and use in the proper context terms relating to the computation of wages and salaries (wages, salaries, bonuses, commissions, basic pay, overtime pay, gross pay, net pay, statutory and non-statutory deductions, taxable income, tax allowance) d) Calculate the wage and/ or salary of an employee from given instructions		Demonstration,Collaboration	Students will be asked to create their own personalised example of autility bill and bring it to class. Online Resources: https://wikieducator.org/images/9/9b/Lesson_6-consumer_arithmetic.pdf	Individual Assignment

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22 Feb 27 – Mar 03	Geometry	**Transformations** a) State the relationships between an object and its image in a plane when it is enlarged from a point(centre of enlargement) in that plane b) Perform enlargements with the centre at the origin with scale factor k, $k \in N$		Demonstration and collaboration.	The use of PowerPoint Presentation Resources and practice: https://www.khanacademy.org/math/basic-geo/basic-geo-transformations-congruence/basic-geo-reflections/a/reflecting-shapes https://www.khanacademy.org/math/basic-geo/basic-geo-transformations-congruence/basic-geo-dilations/v/example-identifying-the-center-of-dilation	Class Activity from quizzies.com 3rd Graded CW (Feb 6th -1Oth)
23 Mar 06-10 24 Mar 13-17		c) Perform reflections and identify images of objects where the mirror line is any given line in the plane. Discuss the difference between triangle that are congruent and those which are similar. d) Perform calculations using the concept of similar triangles. **Construction** a) Revise basic construction (Including the construction of line segments, line and angle bisectors angles and triangles.			The use of geogebra software to teach construction	

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
		b) Construct quadrilaterals using appropriate geometric instruments In Class Progress Test				
25 Mar 20-24						
26 Mar 27-31	Statistics	a) Design and conduct simple experiments, to collect data. b) Determine simple probabilities and draw appropriate conclusions. c) Use fractions and percentages to describe probability d) Interpret a probability given as a fraction or percentage		Guided discovery, collaboration and demonstration	Students will be asked to create an online survey using google forms which will be used for data collection in the following classes. Online resources: https://www.mathsisfun.com/data/probability.html https://www.khanacademy.org/math/probability/probability-geometry/probability-basics/a/probability-the-basics	Activity Sheet Online Survey

SUMMER TERM:

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
28 Apr 17-21	Statistics	**Frequency Tables** a) Differentiate between grouped and ungrouped data.(Discuss terms associated group data including; class width, class intervals, class boundaries, class limits, range. b) Create frequency tables for grouped data		Demonstration, presentation and collaboration	Online Resources: https://www.khanacademy.org/math/ap-statistics/quantitative-data-ap/frequency-tables-dot-plots/v/frequency-tables-and-dot-plots https://www.asu.edu/courses/mat142ej/readings/Statistics.pdf https://www.youtube.com/watch?v=rhCq0Xcvg_E	Individual class Assignment

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
		c) Draw Histograms				
29 Apr 24-28	Number Theory	**Ratio and Proportions** a) Solve more complex problems involving ratio and proportion b) Represent ratios in the form of fractions and decimals; c) Accurately calculate problems involving ratios and proportions; d) Correctly use scale drawings to represent actual objects; e) Calculate scale drawings accurately		Demonstration collaboration	Online Resources: https://www.mathsisfun.com/algebra/directly-inversely-proportional.html https://www.mathsisfun.com/numbers/ratio.html Class Practice: https://www.transum.org/software/SW/Starter_of_the_day/Students/Ratio.asp?Level=6	Class Practice Activity
30 May 1-5	Number Theory	**Sets** Solve simple problems involving, at most, three subsets of the universal set (with at most two intersecting) Use set language correctly Describe a set correctly represent sets using Venn diagram appropriately		Demonstration Collaboration	Online Resources: https://www.mathsisfun.com/sets/sets-introduction.html https://www.mathsisfun.com/sets/venn-diagrams.html	Class Activity from quizzes.com

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
31 May 08-12	Logic and Reasoning	**Truth Tables** a) Revise the concept of proposition and use the language of logic. b) Use Truth tables to determine if two propositions are logically equivalent . c) . Define an argument d) Differentiate between valid argument and valid conclusion. e) Apply deductive reasoning to determine the validity of arguments	Concepts such as; Conjunction, Disjunction if ,then , equivalence, may be investigated. Differentiate between simple and compound propositions	Demonstration Presentation Collaboration		Individual Worksheet from transom.com
32 May 15-18	Numbers	**Matrices** a) Define a matrix b) Identify the order of a Matrix c) Add and Subtract Matrices d) Perform scalar Multiplication on matrices e.) Perform Calculations to		Demonstration Collaboration		Individual Worksheet

Week	NSC Unit	Topics	Comments	Lesson/Method of Delivery	Use of ICT	Student Assessment
		illustrate the Commutativity and Distributivity of Matrices under Addition.				
7	Revision				Revision Worksheet form quizeses.com/ transum.com./google forms and video presentation.	
8	Revision				Revision Worksheet form quizeses.com/ transum.com./google forms and video presentation.	

READING LIST: