MINISTRY OF EDUCATION AND TECHNICAL AND VOCATIONAL TRAINING

CURRICULUM DIVISION

SCIENCES SECTION

MATHEMATICS (HIGH SCHOOL) UNIT

NATIONAL PACING GUIDE

JUNIOR HIGH SCHOOL

GRADES 7 – 9

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BJC

Pacing Guides

MASTER COURSE OUTLINE
BJC

GRADE: 7

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MASTER COURSE OUTLINE
BJC

GRADE: 8

No.	TERM ONE Topics	Month	No.	TERMS TWO & THREE Topics	Month
1.	The Real Number System & Natural and Whole Numbers	Sep	1.	Algebra	Jan
2.	Order of Operations	Sep	2.	Exponents/Indices/Powers	Jan
3.	Sequences of Natural Numbers	Sep	3.	Sets & Venn Diagrams	Feb
4.	Integers	Oct	4.	Patterns, Relations & Functions	Feb
5.	Fractions	Oct	5.	Coordinate Geometry & Graphs	Feb
6.	Decimals	Oct	6.	Geometry & Spatial Sense	March
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9.	Ratios, Rates, Proportions & Variation	Dec	9.	Statistics	May
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MASTER COURSE OUTLINE
B. J. C.

GRADE: 9

No.	TERM ONE Topics	Month	No.	TERMS TWO & THREE Topics	Month
1.	The Real Number System & Natural and Whole Numbers	*Sep*	1.	Algebra	*Jan*
2.	Order of Operations	*Sep*	2.	Exponents/Indices/Powers	*Jan*
3.	Sequences of Natural Numbers	*Sep*	3.	Sets & Venn Diagrams	*Feb*
4.	Integers	*Oct*	4.	Patterns, Relations & Functions	*Feb*
5.	Fractions	*Oct*	5.	Coordinate Geometry & Graphs	*Feb*
6.	Decimals	*Oct*	6.	Geometry & Spatial Sense	*March*
7.	Estimation, Approximation & Rounding	*Nov*	7.	Transformations	*April*
8.	Percents and Percentages/Consumer Math	*Nov*	8.	Measurement	*May*
9.	Ratios, Rates, Proportions & Variation	*Dec*	9.	Statistics	*May*
			10.	Probability	*June*

TERM ONE: 2 September 2024 – 20 December 2024   NO. OF WEEKS: 14

GRADE 7

TOPICS /CONCEPTS	Month	OBJECTIVES The students will be able to:
The Real Number System & Natural and Whole Numbers	Sep	Identify/locate the natural/counting and, whole numbers as points on the real number line. Define and identify odd, even, prime, composite Identify factors and multiples of whole numbers (apply divisibility rules). *** Factorization** • *Rewriting numerical sums and differences as products.* Use list of factors to find H.C.F., use list of multiples to find L.C.M. Prime factorization of whole numbers. Exponential/index notation (base, natural number exponent/index, power). Powers of whole numbers natural number exponents only. Define and identify, square, cube numbers Explore the powers of ten (natural number exponents only). Recognize and explain that our number system is a decimal (base ten) system. Write numbers in expanded form using powers of ten. Multiply whole numbers by powers of ten. Divide whole numbers by powers of ten, with reminders where necessary.

		Prime factorization using index form.
		Problem solving involving addition, subtraction, multiplication, and division, factors multiples, HCF and LCM.
		*Incorporate consumer math problems during problem solving
		Convert between units of money for countries with decimal currency.
		Solving monetary word problems involving one of the four operations.
Order of Operations	Sep	Apply an order of operations mnemonic (BOMDAS)/(BODMAS) or "Bless My Dear Aunt Sally" to evaluate arithmetic expressions with two or more operations, involving whole numbers and common fractions.
		Identifying true arithmetic statements.
		Insert operations and/or brackets to obtain true statements. .
Sequences of Natural Numbers	Sep	Continue sequences of even, odd, multiples, squares, cubes and triangular numbers.
Integers	Oct	Use integers to represent opposite situations.
		Identify/locate integers on the number line.
		Compare and order integers using the number line. Use of inequality symbols.
		Add and subtract integers using the number line.
		Problem solving involving addition, and subtraction
Fractions	Oct	Define rational numbers as common fractions.
		Revise vocabulary of common fractions: fraction, numerator, denominator, proper & improper fractions, mixed numbers, equivalent fractions, reduce fraction, lowest terms.
		Identify/locate rational numbers on the real number line

		Compare & Order with and without the number line. Use of inequality symbols.
		Add, subtract, multiply and divide two fractions and/or mixed numbers.
		Problem solving involving addition, subtraction, multiplication, and division, of two fractions.
Decimals	Oct	Rational numbers as decimals.
		Decimal place value: billions to thousandths
		Reading and writing decimal numbers.
		Writing decimal fractions as decimal numbers and vice versa.
		Identify/locate decimal numbers on the real number line.
		Compare & Order with and without the number line. Use of inequality symbols.
		Adding, subtracting decimals with and without regrouping.
		Multiply and divide decimals by powers of ten.
		Multiply and divide decimals by whole numbers.
		Multiply and divide decimals by a decimal.
		Solve problems using operations on decimals.
Estimation, Approximation & Rounding	Oct	• Rounding whole numbers to a given place value. • Rounding decimals to a given place value and to a given number of decimal places, with and without the number line. • Estimate sums, differences, products and quotients to check the reasonableness of their calculations.

Percents and Percentages/Consumer Math	Nov	• Define percent (%) • Compare and order percents. • Convert percents to common fractions and vice versa. • Convert percents to decimals and vice versa. • Convert between common fractions, decimals and percents. • Solving simple word problems involving percents. • Expressing one quantity as a percentage of another. • Problem solving: Expressing one quantity as a percentage of another.
Ratios, Rates, Proportions & Variation	Nov	• Demonstrate an understanding of the elementary ideas and notation of ratios. • Use a ratio to compare two numbers or similar quantities. • Determine equivalent ratios • Write ratios in the form **1 : a** or **a : 1** (where a is a whole number). • Divide a quantity in a given ratio. • Determine the scale of a map. • Use a map scale to calculate distance.

TERM TWO: 6 January 2025 – 11 April 2025   **NO. OF WEEKS**: 12

GRADE 7

TOPICS/CONCEPTS	Time	OBJECTIVES The students will be able to:
Algebra	Jan	**Algebraic Representation** Terminology & Notation Define & Identify: Constant, Variable, Term, Like Terms, Numerical Coefficient, Expression & Equation Writing basic expressions: Sums, differences, products, & quotients. Writing simple equations involving one operation. **Basic Algebraic Operation** • Operating on terms, each with one symbol: Adding & Subtracting like terms • Multiplying & Dividing terms • Simplifying expressions by collecting like terms. **Substitution** • Evaluate algebraic expressions and formulae by substituting **whole numbers** for symbols. **The Distributive Property** Verify the distributive property using natural numbers. Multiplying a sum by a natural number **Factorization** • Rewriting numerical sums and differences as products.

		Equations • S The idea of simple linear equations. • Create one step linear equations from word problems and solve by inspection. • Solve one-step equations involving: addition, subtraction, multiplication, division using inverse operations, and balancing equations. • Use one-step linear equations to solve word problems. **Inequalities** • Identify the solution sets of simple inequalities. • Represent the solution sets of simple inequalities on the number line.
Exponents/Indices/Powers	Jan	• Squares, cubes and other powers of variables
Sets **&** **Venn Diagrams**	Feb	• Define a set. • Use upper case letters to name sets. • Use set braces (curly brackets, $\{\,\}$) to indicate a set. • List the elements of sets when given precise English descriptions of the sets. • Identify descriptions that do not describe unique sets. • Describe a set using words that indicate precisely which elements belong to the set.

Patterns, Relations and Functions	Feb	Define and recognize a relation. Describe a relation in words. Use arrow diagrams and sets of ordered pairs to represent relations.
Coordinate Geometry & Graphs	Feb	Graphing and Identifying points in the Cartesian plane, integer coordinates only. Graphing and identifying horizontal and vertical lines. Determining lengths of horizontal and vertical line segments.

Geometry & Spatial Sense	March	**Geometric Terminology & Notation**
		
		Define and Identify:
		
		• Plane
		• Plane figure
		• Point
		• Line
		• Line segment
		• Ray
		• Angle
		• Vertex
		• Space
		• Space figure
		• Types of Lines in a plane:
		    - Intersecting
		    - Perpendicular

		- Parallel
		• Use 3 letters or a single letter to name an angle.
		• Recognize physical examples of geometric objects.
		Angle Properties
		Describe and draw different types of angles as fractions of a revolution:
		• Revolution
		• Right
		• Straight
		• Acute
		• Obtuse
		• Reflex
		Define a degree
		- Identify the different types of angles based on their degree measure.
		-
		- Recognize physical examples of angles.
		-
		- Draw and measure angles less than 180 degrees with a protractor and straight edge.
		Triangles, Quadrilaterals and Other Polygons
		Define polygon
		Identify and name polygons with up to ten sides
		Classify triangles according to angles and sides Angles: Acute, Right, Obtuse
		Sides: Scalene, isosceles, equilateral
		Classifying quadrilaterals according to angles and sides

		- Parallelogram - Rhombus - Rectangle - Square - Trapezium/trapezoid - Kite **Circles** Define a circle Define and identify parts of a circle: - Centre - Radius - Diameter - Circumference - Arc - Chord Explain the relationship between radius and diameter. Discover Pi as the ratio of a circle's circumference to its diameter. Determine the diameter given radius and vice versa
GEOMETRY & SPATIAL SENSE **Continued**	March	**Constructions & Scale Drawings** - Construct circles of given radii and diameters using a pair of compasses. **Solid Shapes** Identify and describe common solids shapes. - Cubes - Cuboids

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- Spheres
- Cylinders
- Cones
- Prisms
- Pyramids

Recognize the nets of common solid shapes.

Draw nets and make cubes and cuboids.

Explain the similarities and differences between cubes and cuboids.

State the number of faces, vertices and edges of cubes and cuboids.

Similarity and Congruency

Define and recognize congruent figures.

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TERM THREE: 22 April 2025 – 20 June 2025

NO. OF WEEKS: 8

GRADE 7

TOPICS/CONCEPTS	Time	OBJECTIVES The students will be able to:
Transformations	April	Define transformation Define reflection and mirror line Recognize and draw reflections in horizontal and vertical lines. Define line/reflective symmetry and the axis of symmetry Recognize and draw lines of symmetry so that a given horizontal/vertical line is the axis of symmetry. Complete a shape so that a given horizontal or vertical line is the axis of symmetry.
Measurement	May	**Units of Measurement** A Define length, mass and capacity Define and determine benchmarks for imperial units of length, mass and capacity. Estimate and measure lengths using appropriate imperial units. Estimate mass and capacity using appropriate imperial units. Converting between imperial units of length, mass and capacity. Define and determine benchmarks for metric units of length, mass and capacity. Estimate and measure lengths using appropriate metric units. Estimate mass and capacity using appropriate metric units.

		Converting between metric units of length, mass and capacity.
		Use rough equivalents to convert between imperial and metric units of capacity
		Define and convert between units of time. Reading calendars and schedules
		Read and illustrate time on the 12- hour and 24-hour clocks
		Elapsed time on the 12-hour clock.
		Reading thermometers marked in degrees Fahrenheit and/or Celsius.
		Perimeter and Area
		Define perimeter
		Calculate perimeter of polygons.
		Discover Pi as the ratio of a circle's circumference to its diameter
		Deduce an equation relating the circumference and diameter of a circle.
		Define area
		Determine area by counting squares.
		Calculate area of squares, rectangles and triangles.
		Volume/ Capacity
		Define volume
		Determine volume of cubes

Statistics	May	Read and interpret tables, pictograms, vertical and horizontal bar charts, line graphs, and pie charts.
		Define and identify raw data: categorical and discrete numerical.
		Conduct simple surveys to collect categorical and numerical data.
		Organize raw data (categorical and numerical) using tally charts.
		Representing data using frequency tables, vertical and horizontal bar graphs.
		Draw bar charts, and pictograms to display data.
Probability	June	Define and explain the terminology associated with probability: experiment, outcomes, event, chance, likely, unlikely, certain, impossible, odds.
		Assign a value from 0 to 1 for the likelihood of given events.
		Identify values that represent probabilities.
		Determine the set of all possible outcomes for the following experiments with equally likely outcomes: tossing a coin, rolling a die, selecting/drawing a letter/number/object from a set of letters/ numbers/ objects, spinning a spinner.
		Use the following definition and notation to express probabilities as common fraction: $$P(E) = \frac{\text{Number of Event Occurrences}}{\text{Total Number of Observations}}$$
		Using odds versus probabilities to describe the chances of events occurring.

TERM ONE: 2 September 2024 – 20 December 2024   NO. OF WEEKS: 14

GRADE 8

TOPICS /CONCEPTS	Month	OBJECTIVES The students will be able to:
The Real Number System & Natural and Whole Numbers	Sep	Use prime factorization to find H.C.F. & L.C.M., Multiply and divide whole numbers by powers of ten. Squares and square roots. Use prime factorization to find square roots. Problem solving involving addition, subtraction, multiplication, and division, factors, multiples, H.C.F. and L.C.M., squares and square roots *Review concepts from prior grades* *Incorporate consumer math problems during problem solving*
Order of Operations	Sep	Apply an order of operations mnemonic (BIMDAS)/(BIDMAS), "Please Excuse My Dear Aunt Sally" or (PEMDAS)/(PEDMAS) to evaluate arithmetic expressions with two or more operations, involving integers, common fractions and decimals. Identifying true arithmetic statements. Insert operations and/or brackets to obtain true statements.

Sequences of Natural Numbers	Sep	Identify patterns in sequences of natural numbers to list more terms. Identify patterns in sequences of natural numbers, whole numbers, and integers to list more terms. Identify special sequences and list more terms *(even, odd, prime, triangular, square and cube numbers, Fibonacci Sequence)*
Integers	Oct	• Use the number line/rules derived to add, subtract, multiply and divide integers. • Problem solving involving addition, subtraction, multiplication and division
Fractions	Oct	Order fractions in ascending and descending order with and without the number line. Addition, subtraction, multiplication and division of up to three fractions and/or mixed number and two operations. Problem solving involving addition, subtraction multiplication and division of up to three fractions and two operations.
Decimals	Oct	• Decimal place value: billions to ten thousandths. • Change common fractions to decimals and vice versa. • Identify rational numbers as terminating and recurring (repeating) decimals using the dot (·) and bar (⁻) notation above single repeated digits and blocks of repeated digits. • Comparing and ordering decimals with and without the number line. • Add, subtract, multiply and divide decimals. • Problem solving involving at least two of the operations, addition, subtraction multiplication and division *Consumer Math* • *Solving monetary word problems involving at least two operations.* • *Calculating profit and loss*

Estimation, Approximation & Rounding	Nov	Rounding decimals to a given place value and to a given number of decimal places, with and without the number line.
		Rounding decimal numbers to a given number of significant figures.
		Estimate the results of calculations to check the reasonableness of answers.
Percents and Percentages/Consumer Math	Nov	Calculating a percentage of a number or quantity.
		Percentage increase/decrease
		Calculating percentage profit and profit loss and mark-up and mark-down.
		Calculating discounts.
		Calculating Value Added Tax (VAT)
		*Consumer Math (Include in Decimals)
		Solving monetary word problems involving at least two operations.
		Calculating profit and loss
Ratios, Rates, Proportions & Variation	Dec	Use ratios to compare measurements with different units.
		Simplify ratios with fractional terms.
		Write ratios in the form $1 : a$ or $a : 1$
		Share a quantity in a given ratio.
		Define the term proportion.
		Identify proportions.

		Solve proportions for missing terms Use proportions to find missing quantities.

TERM TWO: 6 January 2025 – 11 April 2025   **NO. OF WEEKS**: 12

GRADE 8

TOPICS/CONCEPTS	Time	OBJECTIVES The students will be able to:
Exponents/Indices/Powers	Jan	• Identifying the base and exponent in algebraic expressions. • Rewriting expressions involving powers.
Algebra	Jan	**Algebraic Representation** • Translate English phrases into algebraic expressions and vice versa: up to two operations without brackets. • Translate English sentences into algebraic equations. **Basic Algebraic Operation** Operating on terms, involving two or more symbols and powers. Simplify expressions by collecting like terms including terms with powers. **Exponents/Indices/Powers** Identifying the base and exponent in algebraic expressions. Rewriting expressions involving powers. **Substitution** • Evaluate algebraic expressions and formulae by substituting **integers** for symbols.

		The Distributive Property • Multiplying sums and differences by integers and variables. **Factorization** Rewriting sums and differences of simple algebraic term as products. **Algebraic Fractions** Multiplying and dividing simple algebraic fractions. **Equations** • Solve two step equations. • Solve simple linear equations involving brackets and equations with variables on both sides. • Use two-step linear equations to solve word problems. **Transposition of Formulae** • Change the subject of simple formulae with one operation. **Inequalities** • Describe and interpret sets of integers using inequality symbols.
Sets **&** **Venn Diagrams**	Feb	Define and identify proper and improper subsets of given sets Identify and use the following symbols: $\subset$ is a proper subset of $\not\subset$ is not a proper subset of $\subseteq$ is a proper or improper subset of

		$\neq$ is not a proper nor improper subset of
		List all the subsets of sets with up to four elements.
		Show that the formula 2^n (where n is the number elements in a set) can be used to calculate the total number of different subsets for a given set.
		Draw Venn diagrams to illustrate sets and the relationship between two sets.
		Draw, shade and use Venn diagrams to determine unions and intersections of two sets.
		Read and interpret Venn diagrams showing cardinal numbers for up to three sets
Patterns, Relations and Functions	Feb	Identify the different types of relations: one to one, many to one and one to many. Identify types of relations from arrow diagrams.
Coordinate Geometry & Graphs	Feb	Construct/complete table of values for a linear function. Graphing lines from a table of values, integer coordinates only.
Geometry & Spatial Sense	March	**Geometric Terminology & Notation** Define and identify complementary and supplementary angles. Define and identify angles at a point **Angle Properties** Review Measure and draw angles using a protractor and straight edge. Draw and determine the measure of a reflex angle. Determine complements and supplements of angles.

		Calculate the size of a missing angle at a point. **Triangles, Quadrilaterals and Other Polygons** Informally prove that the sum of the interior angles of any triangle is equal to 180°. Determine the size of a missing interior angle of a triangle. Properties on equilateral and isosceles triangles. Informally prove that the sum of the interior angles in any quadrilateral is equal to 360°. Determine the size of the missing interior angle of a quadrilateral. **Circles** - Define and identify parts of a circle: - Centre - Radius - Diameter - Circumference - Arc - Chord - Quadrant - Semi-circle
GEOMETRY & SPATIAL SENSE **Continued**	March	**Constructions & Scale Drawings** Bisect line segments and angles using straight edge and compasses. **Solid Shapes** Recognize the nets of common solid shapes. Draw nets and make cubes, cuboids, cylinders and cones.

		Recognize the nets of prisms and pyramids.
		Make pyramids and prisms from nets.
		Determine the number of faces, vertices and edges of prisms and pyramids.
		Discover Euler's formula for prisms and pyramids.
		Similarity and Congruency
		Define and recognize similar figures.

TERM THREE: 22 April 2025 – 20 June 2025

NO. OF WEEKS: 8

GRADE 8

TOPICS/CONCEPTS	Time	OBJECTIVES The students will be able to:
Transformations	April	Recognize and draw reflections. Recognize and draw all the lines of symmetry in a given shape. Define rotation Recognize rotations of and clockwise and anticlockwise about a given point. Complete a shape so that a given line is the axis of symmetry. Complete a shape so that given horizontal and vertical lines are both axes of symmetry.
Measurement	May	**Units of Measurement** Convert units of time Adding and subtracting mixed units of time. Convert 12-hour time to 24-hour and vice-versa. Calculating elapsed time Problem solving involving calendars, schedules and time duration. Comparing temperatures in degrees Fahrenheit and Celsius. **SPEED:** Define and calculate average speed.

		Perimeter and Area Calculate perimeters of simple compound shapes involving squares, rectangles and triangles. Explore the value of pi. Calculate the circumference of circles. Apply formulas for areas of squares, rectangles, triangles and parallelograms. **Volume/ Capacity** Determine volume of cubes and cuboids.
Statistics	May	Define and calculate mean, median, mode and range of a data set. Solve problems involving mean, median, mode and range. Define and collect categorical discrete and continuous numerical data. Use tally charts and frequency tables including intervals to organize primary and secondary data. Draw and interpret pictograms, vertical and horizontal bar charts, line graphs. Define and construct pie charts. Read and interpret pie charts.
Probability	June	Express probabilities of single events as common fractions, decimals, and percents. Determine the probability that an event does not happen. Deduce the following relationship for complementary events: Calculate the probability that an event does not happen using:

P (event A does not happen) = 1 – P(event A does not happen)

$P(\text{event A does not happen}) =$

$1 - P(\text{event A happens})$

Use probabilities to estimate the number of times an event is likely to happen when experiments are repeated.

TERM ONE: 2 September 2024 – 20 December 2024   NO. OF WEEKS: 14

GRADE 9

TOPICS /CONCEPTS	Time	OBJECTIVES The students will be able to:
The Real Number System & Natural and Whole Numbers	Sep	**Cubes and cube roots** . Use prime factorization to find cube roots. Use associative and commutative properties of addition and multiplication and the distributive property over whole numbers. Solve problems using H.C.F./ G.C.F., L.C.M, square roots and cube roots.
Order of Operations	Sep	• Use an appropriate order of operations mnemonic to evaluate arithmetic expressions with at least three operations, involving integers, common fractions and decimals. • • Identifying true arithmetic statements. • • Insert operations and/or brackets to obtain true statements. •
Sequences of Natural Numbers	Sep	Identify patterns in sequences of natural numbers, whole numbers, integers, common and decimal fractions to list more terms.
Integers	Sep	Revise using the number line and rules for adding, subtracting, multiplying and dividing integers. Powers of integers. Problem solving using integers in practical situations

Fractions	Oct	More addition, subtraction, multiplication and division of up to three fractions and/or mixed numbers and two operations. More problem solving involving addition, subtraction multiplication and division of up to three fractions and two operations. Locate/graph points on a number line.
Decimals	Oct	Decimal place value: billions to millionths. Add, subtract, multiply and divide decimals.
Estimation, Approximation & Rounding	Oct	Rounding decimal numbers to a required place value, number of decimal places, and significant figures. Estimate the results of calculations to check the reasonableness of answers.
Percents and Percentages/Consumer Math	Nov	Percents greater than 100 and less than 1. Convert between common fractions, decimals and percents. Review expressing one quantity as a percentage of another. Review calculating a percentage of a number or quantity. **Consumer Math** Use to calculate interest, rate, time or principal. Loans and investments. Calculating wages/salaries, commission, bonuses and deductions, hire purchase. Calculating taxes and exchange rates

		Calculating the amount due on telephone and electricity bills, given the necessary information.
Ratios, Rates, Proportions & Variation	Nov	Define unit rate
		Determine unit rates
		Problem solving involving quantities that are directly proportional
		Define rate
		Identify common rates
		Problem solving involving quantities that are indirectly proportional
Algebra	Jan	**Algebraic Representation** Translate/write/create algebraic expressions with brackets. Translate/write/create algebraic equations with brackets. **Basic Algebraic Operations** Identify expressions that can be simplified by collecting like terms. Multiply and divide monomials without powers. Multiply and divide monomials by expanding powers. **Substitution** Evaluate algebraic expressions and formulae by substituting **rational numbers** for symbols.

	Nov	**The Distributive Property** Expanding products and collecting like terms to simplify expressions. **Factorization** Identifying factors of monomials to determine the H.C.F. Factoring simple binomials using the H.C.F. **Algebraic Fractions** • Add and subtract algebraic fractions with constant and variable denominators. • Multiplication and division of algebraic fractions with monomial numerators and denominators **Equations** Review solution of simple linear equations involving brackets and equations with variables on both sides. Use linear equations to solve word problems. **Transposition of Formulae** • Change the subject of simple formulae with no more than two operations and the subject appearing once. **Inequalities** Translating English phrases to inequalities and vice versa. Describe and interpret sets of real numbers using inequality symbols. Solving simple linear inequalities involving one operation. Illustrate the solution set on the number line. Graphing simple inequalities in the Cartesian plane.

Exponents/Indices/Powers	Nov	Discover and apply the laws of indices for multiplying and dividing powers of the same base. (Constant and variable bases and natural number exponents).
Sets & Venn Diagrams	Dec	Define and identify Equal and Equivalent sets. Define, identify and determine Complements of sets that are subsets of given universal sets. Define, identify, and determine unions and intersections of two sets. Draw Venn diagrams to illustrate up to two sets that are subsets of a given universal set. Draw, shade and Use Venn diagrams to determine complements of sets, unions, and intersections of two sets. Draw and use Venn diagrams to solve simple problems involving universal sets that have one or two subsets.

TERM TWO: 6 January 2025 – 11 April 2025   **NO. OF WEEKS**: 12

GRADE 9

TOPICS/CONCEPTS	Time	OBJECTIVES
		The students will be able to:
Algebra	Jan	**Algebraic Representation** Translate/write/create algebraic expressions with brackets. Translate/write/create algebraic equations with brackets. **Basic Algebraic Operations** Identify expressions that can be simplified by collecting like terms. Multiply and divide monomials without powers. Multiply and divide monomials by expanding powers. **Substitution** Evaluate algebraic expressions and formulae by substituting **rational numbers** for symbols. **The Distributive Property** Expanding products and collecting like terms to simplify expressions. **Factorization** Identifying factors of monomials to determine the H.C.F. Factoring simple binomials using the H.C.F. **Algebraic Fractions**

		• Add and subtract algebraic fractions with constant and variable denominators. • Multiplication and division of algebraic fractions with monomial numerators and denominators - **Equations** Review solution of simple linear equations involving brackets and equations with variables on both sides. Use linear equations to solve word problems. **Transposition of Formulae** • Change the subject of simple formulae with no more than two operations and the subject appearing once. **Inequalities** Translating English phrases to inequalities and vice versa. Describe and interpret sets of real numbers using inequality symbols. Solving simple linear inequalities involving one operation. Illustrate the solution set on the number line. Graphing simple inequalities in the Cartesian plane.
Sets& Venn Diagrams	Feb	Define and identify Equal and Equivalent sets. Define, identify and determine Complements of sets that are subsets of given universal sets. Define, identify, and determine unions and intersections of two sets. Draw Venn diagrams to illustrate up to two sets that are subsets of a given universal set. Draw, shade and Use Venn diagrams to determine complements of sets, unions, and intersections of two sets.

		Draw and use Venn diagrams to solve simple problems involving universal sets that have one or two subsets.
Patterns, Relations and Functions	Feb	Determine the inverse of a one to one function. Determine and evaluate composite functions.
Coordinate Geometry & Graphs	Feb	Construct/complete table of values for a linear function. Graphing lines from a table of values, including rational coordinates.
Geometry & Spatial Sense	Mar	**Geometric Terminology & Notation** Define and identify adjacent angles and vertically opposite angles. Define and identify angles formed by parallel lines and a transversal: corresponding angles, alternate angles, co-interior angles. **Angle Properties** • Identify and determine vertically opposite and adjacent angles. • • Identify and determine angles formed by parallel lines and a transversal –corresponding angles, • Alternate angles, co-interior angles. • • Determine missing Adjacent complementary and adjacent supplementary angles **Triangles, Quadrilaterals and Other Polygons** Define an exterior angle of a polygon.

		Recognize that adjacent interior and exterior angles are supplementary. Informally prove that an exterior angle of a triangle is the sum of the remote interior angles. Informally prove that the sum of the exterior angles of any triangle and any quadrilateral is Determine the size of missing angles of triangles and quadrilaterals. **Circles** Define and identify parts of a circle: • Centre • Radius • Diameter • Circumference • Arc • Chord • Quadrant • Semi-circle • Sector Segment

GEOMETRY & SPATIAL SENSE
Continued
	Mar	**Constructions & Scale Drawings**
		
		Construct and bisect angles of 60° and 90°.
		
		Construct triangles given:
		  (1) One side and two angles
		  (2) Two sides and an angle.
		      Three sides including equilateral
		
		Solid Shapes

		Recognize the nets of platonic solids.
		Determine the number of faces, vertices and edges of platonic solids.
		Make platonic solids from nets.
		Verify that Euler's formula holds for platonic solids.
		Similarity and Congruency
		Define and recognize congruent and similar figures.
		Determine the ratio of corresponding sides in similar figures.

TERM THREE: 22 April 2025 – 20 June 2025

NO. OF WEEKS: 8

GRADE 9

TOPICS/CONCEPTS	Time	OBJECTIVES The students will be able to:
Transformations	April	Identify and draw reflections in the x-axis, y-axis and horizontal/vertical lines. Recognize and draw lines of symmetry of shapes in the Cartesian plane. Identify rotations about the origin. Define and identify translations. Describe the movement of a shape under translation Translate objects given the description of the movement. Complete a shape so that the x-axis, y-axis or a given horizontal or vertical line is the axis of symmetry. Complete a shape in the Cartesian plane so that the x-axis and y-axis or given horizontal and vertical lines are both axes of symmetry.
Measurement	May	**Units of Measurement** Converting between metric units of length, mass and capacity. Problem solving involving 12-hr and 24-hr time. Reading schedules Problem solving involving elapsed time. Converting from degrees Fahrenheit to degrees Celsius and vice versa.

		Interpret travel and conversion graphs.
		Perimeter and Area
		Apply the formula for area of circle given the radius or the diameter. Include problems with semi-circles and quadrants.
		Apply the formula for computing the area of a trapezium.
		Calculate areas of borders including determining missing lengths.
		Calculate the perimeter and area of compound shapes composed of rectangles, triangles, parallelograms trapeziums and circles.
		Define surface area.
		Calculate the surface area of cubes and cuboids
		Volume/ Capacity
		Understand the difference between volume and capacity
		Define litre
		Calculate the capacity of containers that are cubes and cuboids.
		Converting cubic units and litres.
Statistics	May	Interpret, select and draw an appropriate type of graph to display data.
		Calculate mean, median, mode and range from a set of data displayed in an ungrouped frequency table.
		Determine the modal interval and the interval containing the median from a grouped frequency table.

Probability	June	Distinguish between Experimental and Theoretical Probabilities. Compare experimental and theoretical probabilities for the following experiments: tossing a coin, rolling a die selecting/drawing a letter/number/object from a set of letters/numbers/objects, spinning a spinner. Drawing tables to represent possibility spaces for the following experiments: tossing two coins, rolling a pair of dice, selecting/drawing letters/ numbers/ objects from two sets of letters/ numbers/ objects, tossing a coin twice, rolling a die twice, spinning a spinner twice, tossing a coin and rolling a die, etc. Determining pr obabilities from tables representing probability spaces.