MYP SUBJECT GROUP OVERVIEW (SGO)
MATHEMATICS

MYP YEAR 1 MATHEMATICS							
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Numerical and abstract reasoning **40 sessions @ 40 min each**	Form	Representation	Orientation in space and time Exploration : Civilizations and Human interaction How Numbers and Number Systems evolved. It will be a group task and the presentation will be done in the class based on the research work.	Different forms of representation develop as civilizations evolve and humans interact.	Criterion A Knowing and understanding Criterion C Communicating Criterion D Applying mathematics in real-life contexts	Thinking skills Critical Research Information Literacy Learner Profile: Thinker Knowledgeable	1Place value and rounding - Numbers # Interpret decimal notation and place value; multiply and divide by 10, 100, 1000. Order decimals, including measurements, changing these to the same units. # Round whole numbers to the nearest 10, 100 or 1000 and decimals, including measurements, to the nearest whole number or one decimal place.Recognize multiples, factors, common factors and primes. # Find the lowest common multiple and Greatest common divisor in simple cases.Use the order of operations to work out simple calculations (BODMAS) # Interpreting results of calculations.Recognize squares of whole numbers to at least 20x20, and the corresponding square roots # Choose suitable units of measurement to estimate, measure, calculate and solve problems in everyday contexts.Know abbreviations for and relationships between metric units; convert between different units. 2.Multiplying and dividing # Number facts,Mental multiplication and division # Divisibility test, Multiply and divide decimals with one and/or two places by single digit numbers.Multiplying decimals by integers 3. Negative numbers # Recognize negative numbers as positions on a number line.Add & subtract integers 4. Graphs in real life contexts Draw and interpret graphs in real life contexts involving more than one stage, e.g.travel graphs. 5.Time and scales # Know the relationships between units of time; understand and use the 12-hour and 24-hour clock systems; interpret timetables; calculate time intervals 6. Fractions # Recognize the equivalence of simple fractions, decimals and percentages.Simplify fractions by cancelling common factors and identify equivalent fractions.Change an improper fraction to a mixed number, and vice versa.

							# Convert terminating decimals to fractions and convert the fractions to decimals. Add and subtract two simple fractions.Find fractions of a quantities (whole number answers) # Multiply a fraction by an integer.Comparing fractions using diagrams and decimals. 7. Percentages # Understand percentage as the number of parts in every 100 # Use fractions and percentages to describe parts of shapes, quantities and measures.Calculate simple percentages of quantities (whole no.answers) and express a smaller quantity as a fraction or percentage of a larger one. # Use percentages to represent and compare different quantities. # Calculate simple percentages and fractions of quantities. 8. Ratio and proportion # Use ratio notation, simplify ratios and divide a quantity into two parts in a given ratio.Recognize the relationship between ratio and proportion. # Use direct proportion in context; solve simple problems involving ratio and direct proportion. Connection- Math - Time and I&S - Latitudes and Longitudes Service as Action- Exploration of Evolution of Numbers / (International Mindedness) Learning outcome- Discuss, plan and evaluate .

| Thinking with Models

30 sessions @ 40 min each | Relationship | Pattern Generalization | Identities and relationships

Exploration: Identify Formation

How learning algebra is like learning a new, and useful language and the rules of algebra simplification.
Making of patterns with matchsticks,
U-pins,
Button and
Straws.
Through
patterns, generating the nth term rule | Using patterns and rules is the key to identify formations. | Criterion B Investigating Patterns

Criterion C Communicating | Thinking skills Critical Transfer Learner Profile: Thinker Communicator | 1. Algebra
Use letters to represent unknown numbers or variables
Understand like and unlike terms
Understand power notation
Construct simple algebraic expressions
Simplify linear expressions
Be able to do addition and subtraction of algebraic expression
Simplification of algebraic expression using brackets (simple expressions)
2 Coordinates, functions, graphs and equations
Construct and solve simple equations in one variable
Represent simple functions using words, symbols and mappings
Generate coordinate pairs that satisfy a linear equation, where y is given explicitly in terms of x; plot the corresponding graphs, recognize straight line graphs parallel to the x or y axis
3 Sequences and formulae
Generate sequences from spatial patterns and describe the general term in simple cases
Find a term-to-term rule and the nth term rule for a sequence of numbers
Derive and use simple formulae.Substitute real numbers for letters in a formula |
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| Reasoning with data 30 sessions @ 40 min each | Relationship | Representation Validity | Globalization and sustainability Exploration: Data driven – Decision making Application of various statistical tools to study and analyse data belonging to different communities. Survey in the field of sports, transport, entertainment. | Visual representation of data helps to logically identify relationships that can justify our decisions. | Criterion A Knowing and Understanding Criterion C Communicating | Research Skills Information Literacy Skills Learner Profile: Inquirer | 1.Data collection # Decide which data would be relevant to an enquiry and collect and organize the data. # Design and use a data collection sheet or questionnaire for a simple survey. 2. Averages # Calculate the mean median, mode and range of a set of data. 3. Displaying data # Draw and interpret bar-line graphs and bar charts, frequency diagrams for grouped discrete data, simple pie charts, and pictograms. 4. Statistics # Construct and use frequency tables to gather discrete data, grouped where appropriate in equal class intervals # Compare two simple distributions using the range and the mode, median or mean. 5. Probability # Understand and use the probability scale from 0 to 1. # Find probabilities based on equally likely outcomes in simple contexts. # Identify all the possible mutually exclusive outcomes of a single event. # Use experimental data to estimate probabilities. # Compare experimental and theoretical probabilities in simple contexts. |

Spatial reasoning Geometrical Constructions, Angle Properties and Geometric Reasoning 40 sessions @ 40 min each	Logic	Measurement	Personal and Cultural Expression Exploration : Exploration:Artistry and creativityObservation of symmetry in their surroundings/Architectures in various countries	Artistry and creativity are enhanced through an understanding of how measurement helps to define forms.	Criterion B Investigating patterns Criterion C Communicating Criterion DApplying mathematics in real-life contexts	Thinking Skills Critical Creative Learner Profile: Thinker, Communicator	1 Angles# Identify and calculate the missing angles on a straight line and the anglesaround a point# Identify parallel and perpendicular lines and understandthe rules that apply to these lines# Recognize and use the angle properties of triangle, quadrilateral.# Solve simple geometrical problems by using side and angle properties toidentify equal lengths or calculate unknown angles, and explainreasoning.2. Area and perimeter# Know the abbreviations for and relationships between square meters,square centimeters and square millimeter#Derive and use formulae for the area and perimeter of a rectangle;calculate the perimeter and area of compound shapes made fromrectangles.3. Volumes and surface areas# Derive and use the formula for the volume of a cuboids;calculate volumes of cuboids.# Calculate the surface area of cubes and cuboids from their nets.4. 2D and 3D shapes# Read and plot coordinates of points determined by geometric information in all four quadrants.# Identify, describe, visualize and draw 2-D shapes in different orientations.# Identify 3D shapes# Use the notation and labelling conventions for points, lines, angles andshapes5. Constructions# Use a protractor to construct or measure an angle.# Construct a triangle using a ruler and protractor given the length of thebase and the sizes of the base angles# Construct a triangle using a ruler and compasses only given the lengths ofthe three sides.# Construct squares, rectangles, regular polygon6. Symmetry# Name and identify side, angle and symmetry properties of specialquadrilaterals and triangles, and regular polygons# Recognize and describe common solids and some of their properties. # Recognize line and rotation symmetry in 2-D shapes, draw lines ofsymmetry and complete patterns with two lines of symmetry# identify the order of rotation symmetry7. Transformation.# Transform 2-D shapes by reflection in a given line, rotation about a givenpoint, translation.Connection-Visual Arts- Geometric patterns observed in various textiles,flooring, monuments etc

MYP YEAR 2 MATHEMATICS							
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Numerical and abstract reasoning 40 Sessions @ 40 min. each	Logic	Simplification, equivalence	Identities and relationships Exploration-Competition and cooperation between humans Student will explore: Does the height of an athlete play a major role in the athlete's overall performance?	Using a logical process to simplify quantities and establish equivalence help analyse human cooperation.	CriterionA Knowing and understanding CriterionB Investigating Patterns Criterion C Communicating CriterionD Applying mathematics in real- life contexts	Thinking skills-creative thinking Self management-organisation Learners Profile Knowledgeable Thinker	1 Numbers- Integers # Understanding integers and be able to add, subtract, multiply and divide integers. # Identify and use multiples, factor # common factors, highest common factor, lowest common multiple and primes; # write a number in terms of its prime factors # Calculate squares, positive and negative square roots, cubes and cube roots; # use the notation of square and cube roots, index notation for positive integer power. # Comparing and ordering decimals and rounding numbers. # Powers and roots, order of operations 2. Fractions, decimals and percentages # Convert fraction to decimal using division; know that a recurring decimal is a fraction. # Order fractions by writing with common denominators or dividing and converting to decimals. # Add, subtract, multiply and divide fractions and mixed numbers, rational numbers. # Calculate fractions of quantities # Multiply and divide an integer by a fraction # Find equivalent fractions, decimals and percentages by converting between them. # Calculate and solve problems involving percentages of quantities # Express one given number as a fraction or percentage of another # Calculate simple Interest, principal, amount, rate of interest, time from the given information. # Use equivalent fractions, decimals and percentages to compare different quantities. 3. Ratio and proportions # Simplify ratios, including those expressed in different units; # divide a quantity into more than two parts in a given ratio. # Use the unitary method to solve simple

							problems involving ratio and direct proportion. # Recognize when two quantities are directly proportional; solve problems involving proportionality, e.g. converting between different currencies Learning Outcome- Develop international-mindedness through global engagement.
Thinking with Models 40 sessions @ 40 min each	Form	Simplification Generalization	Scientific and technical innovation Exploration- Patterns in the natural world to understand relationships Students will explore: An activity to find relationships using sequence patterns/creating puzzle.	Producing generalized forms through simplification can help to clarify, solve and create mathematical solutions.	Criterion B Investigating Patterns Criterion C Communicating	Thinking Skills Communication Skills Affective Skills Learners profile Thinker Communicator	1. Expressions # Know that letters play different roles in equations, formulae and functions; # know the meaning of formula and function. # Know that algebraic operations, including brackets, follow the same order as arithmetic operations. # Construct linear expressions. # Simplifying and expanding expressions # use index notations for small positive integer powers. . # Construct and solve linear equations with integer coefficients. # Solve simple word problems of linear equation. 2. Sequences and functions # Generate terms of a linear sequence using term to term and position-to term rules. # Find term-to- term and position-to-term rules of sequences # Use a linear expression to describe the nth term of a simple arithmetic sequence, justifying its form by referring to the activity or practical context from which it was generated. # Express simple functions algebraically and represent them in mappings. # Derive and use simple formulae. # Substitute positive and negative integers into formulae, linear expressions and expressions involving small powers. # Change the subject of formula. 3. Linear Graphs # Construct tables of values and use all four quadrants to plot the graphs of linear functions , where y is given explicitly in terms of x ; recognize that equations of the form $y = mx + c$ correspond to straight-line graphs. # Finding mid point of the line segment. 4. Real life graphs # Use compound measures to make comparisons in real life contexts e.g. travel graph and value of money # Solve problems involving average speed

Spatial reasoning 30 sessions @40 min. each	Relationship	Generalization	Orientation in space and time Exploration- Natural and Human landscapes and resources Students will explore : Use of shapes in the formation of natural and human made landscapes.	Generalizing relationships can help explore the formation of human and natural landscapes.	CriterionA- Knowing and understand ing CriterionD Applying mathematics in real- life contexts	Thinking skills Creative, Critical Learner profile Thinker Communicator	1.Shapes # Know that if two 2-D shapes are congruent, corresponding sides and angles are equal. # Classify quadrilaterals according to their properties , including diagonal properties # Know that the longest side of the right-angled triangle is called the hypotenuse # Identify adjacent angles , vertically opposite angles, linear pairs, and supplementary and complimentary angles # Identify alternate angles and corresponding angles # Know that the angle sum of a triangle is 180° and that of a quadrilateral is 360° # Know that the exterior angle of a triangle is equal to the sum of the two interior opposite angles. # Solve geometrical problems using properties of angles, of parallel and intersecting lines, and of triangles and special quadrilaterals, explaining reasoning with diagrams and text. 2.Symmetry and Transformation # Identify all symmetries of 2-D shapes. # Use the coordinate grid to solve problems involving translations, rotation, reflection and enlargements. # Recognize that translation, rotation and reflection preserve length and angle and map object on to congruent images. # Know what is needed to give precise description of a reflection, rotation,translation or enlargement. # Transform two-dimensional shapes by rotation, reflection, enlargement and translation. 3. Area volume and Surface area # Derive and apply the formulae of the area of a triangle, parallelogram and trapezium. # Calculate areas of compound two-dimensional shapes # Calculate lengths, surface areas and volumes of cubes and cuboids. # Know the definition of a circle and the names of its parts. #Know and use formulae for the circumference and area of a circle. # Derive and apply the formulae of the area of a triangle, Parallelogram. 4. Constructions and Nets

							# Construct perpendicular bisector, angle bisector, circles, arcs and triangles given the three sides (SSS) and a right angle, hypotenuse and one side(RHS) # Draw simple nets of solids, like cubes and cuboids, regular tetrahedron, square- based pyramid, and triangular prism. # Use simple nets of solids to work out their surface areas. 5. Scale Drawings and Measures # Interpret and make simple scale drawings. # Converting between miles and kilometres. # Choose suitable units of measurement to estimate, measure, calculate and solve problems involving mass, length, area, volume and capacity. Connection: Visual Arts
Reasoning with data 30 sessions @40 min each	Relationship	Pattern Representation	Globalization and sustainability Exploration Population and Demography Students will explore: if Literacy rates can be a measure of the quality of the educational system in a country.	Different statistical representations of data make it easier to understand and analyse relationships within communities.	Criterion A Knowing and Understanding	Thinking Skills: Critical Self- Management Organisa tion Reflection Learner profile: Thinker Inquirer	1. Data collection # Suggest a question to explore using statistical methods; # identify the sets of data needed, how to collect them, sample sizes and degree of accuracy # Collect and tabulate discrete and continuous data, choosing suitable equal class intervals where appropriate 2. Averages and spread # Calculate statistics and select those most appropriate to the problem. # Compare two distributions, using the range an d one or more of the mode,median and mean. # Select, draw and interpret diagrams and graphs, including frequency diagrams for discrete and continuous data, line graphs for time series, pie charts and stem-and-leaf diagrams. # Interpret tables, graphs and diagrams and make inferences relating Statistics. 3.Probability # Know that if the probability of an event occurring is p, then the probability of it not occurring is (1- p) # Find the probabilities based on equally likely outcomes. # Listing out mutually exclusive outcomes. # Recognize that when experiments are repeated different outcomes may result and increasing the number of times an experiment is repeated generally leads to better estimates of probability.

	MYP YEAR 3 MATHEMATICS						
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Numerical and abstract reasoning 40 sessions @ 40 min each	Form	Simplification Representation	Scientific and technical innovation Exploration: Exploration: System, Model, Process and solution Exchange rate Finding the total expenditure of a person travelling five different countries having different currencies as a mode of payment. This is a group work and the presentation will be done in the class based on the research done.	Numbers can be simplified and represented in different forms to have an understanding of real world systems, processes and solutions.	Criterion A: Knowing and understanding	Thinking skills - Cluster: Transfer Skills Learner Profile: Inquirer	1. Place value, ordering and rounding # Multiplying and Dividing the decimals and powers of 10 # Rounding # Significant figures # Order of operations 2. Integers, Powers and Roots # Directed numbers: addition, subtractions, multiplications and division. # Square Roots and Cube Roots. # Indices 3. Fractions # Fractions in its simplest form # Operations in fractions - addition, subtractions, multiplications and division. 4. Ratio, proportion and percentages # Comparing different quantities # Direct Proportion : Solve problems involving proportionality. # Percentages changes # Simple interest, discount, profit, loss and tax. # Comparing quantities using fractions and percentages. # Solving Practical problems # Conversion between different currencies. 5. Mental Methods # Integers and decimals Mental calculations with fractions and percentages. connections- Business Studies - analysis of financial statement

Thinking with models	Relationship	Model Generalization Patterns	Scientific and technical innovation	Discoveries of patterns in the natural world can be generalized to understand relationships.	For Algebra: CriterionA Knowledge and Understanding	Thinking skills Cluster: Creative Thinking Skills	1. Algebraic expressions
30 sessions @40 min each			Exploration - Principles and discoveries		For Sequences - Criterion B: Investigating Patterns Criterion C: Communicating	Communication skills Research skills	# Index laws # Expressions # Factorising 2. Sequences # Generating sequences # Finding nth term 3. Functions # Function Notations # Inverse functions 4. Expressions and formulae
			Fibonacci sequences and Golden Ration appearing in nature and its applications. Deriving the value of Golden ration in reference to the Fibonacci sequence.			Learner Profile: Communicator	# Simplification and constructions of expression # Substituting into expressions. # Deriving and Using formulae # Expanding of two linear expression (Expanding Brackets) # Changing the subject #Adding and subtracting algebraic fractions 5. Equations and inequalities # Constructing and Solving Linear Equations # Solving Problems # Solving Simultaneous Equations with like and unlike coefficients # Inequalities: Understanding and solving inequalities # Inequalities on a number line

Spatial reasoning Geometrical Constructions, Angle Properties and Geometric Reasoning 40 sessions @40 min each	Form	Approximation Space Quantity	Personal and Cultural Expression Exploration Artistry, creation, Beauty Explore various monuments and identify and analyse the geometrical patterns and its details.	Analysing relationships between space and quantity helps in enhanced appreciation of the aesthetic	Criterion B : Investigating Patterns Criterion C : Communicating Criterion D : Applying mathematics in real-life contexts	Thinking Skills : Critical Thinking Learner Profile: Thinker, Communicator	1. Angles and geometrical reasoning # Calculate the interior or exterior angle of any regular polygon. # Solve problems using properties of angles, of parallel and intersecting lines, triangles, other polygons and circles. 2. Pythagoras Theorem # Know and use Pythagoras theorem to solve two- dimensional problems involving right-angled triangles 3. Compound measures # Solve problems involving measurements in a variety of contexts. # Solve problems involving Speed # Use compound measures to make comparisons in real life contexts e.g. travel graph and value of money. 4. Area Perimeter And Volume # Convert between metric units of area, volume and capacity. # Solve problems involving the circumference and area of circles.Calculate lengths, surface areas and volumes in right-angled prisms and cylinders. 5.Tessellations # Tessellate triangles and quadrilaterals and relate to angle sums and half turn rotations; know which regular polygons, tessellate, and explain why others will not. 6. Symmetry # Draw and analyse 3D shapes through plans and elevations. # Identify reflection symmetry in three dimensional shapes. 7.Construction, Loci, Bearing And Scale Drawings # Use a straight edge and compasses to carry out various geometrical constructions. # Use bearings (angles measured clockwise from north) to solve problems involving distance and directions # Make and use scale drawings and interpret maps. # Find by reasoning the locus of a point that moves at a given distance from a fixed point, or at a given distance from a fixed straight line. 8. Transformations # Use the coordinate grid to solve problems involving translations, rotation, reflection and enlargements # Transform two-dimensional shapes by combinations of rotation,reflection and translations.

							# describe the transformation that maps an object onto its image.
							# Enlarge two-dimensional shapes, given a centre and positive.integer scale factor; identify the scale factor of an enlargement as the ratio of the lengths of any two corresponding line segments.
							# Recognize that translation, rotation and reflection preserve length and angle and map object on to congruent images, and that enlargements preserve angle but not length.
							# Know what is needed to give precise description of a reflection,rotation, translation or enlargement.
							9.Graphs
							# Inverse of a linear function.
							# Construct tables of the values and plot the graphs of linear functions, where y is given implicitly in terms of x
							# Rearranging the equations into the form y = mx + c
							# Know the significance of m and find the gradient of a straight line graph
							# Find the appropriate solutions of a simple pair of simultaneous linear equations by finding the point of intersections of their graphs
							# Use systematic trial and improvement methods to find approximate solutions of equations such as $x2 + 2x = 20$.
							# Construct functions arising from real life problems
							# Draw and interpret their graphs.Use algebraic methods to solve problems involving direct proportion, relating solutions to graphs of the equations.
							# Graphical solution of simultaneous equations.
							Possible connection : Visual Arts. eg. Geometrical patterns observed in various textiles, flooring, monuments.

Reasoning with data 30 sessions @ 40 min each	Relationships	Representation Validity	Globalisation and Sustainability Exploration - Population and demography Research demographic data of Indian states and its literacy level	Statistical representations of demographic data makes it easier to understand, analyze and validate relationships within variables	Criterion C : Communicating Criterion D : Applying mathematics in real-life contexts	Thinking skills - Cluster:Critical Thinking skills Communication Self- Management: Organisation Reflection Learner Profile: Thinker	1.STATISTICS # Suggest a question to explore using statistical methods # identify the sets of data needed, how to collect them, sample sizes and]degree of accuracy. # Identify primary or secondary sources of suitable data . # Design, trial and refine data collection sheets. # Collect and tabulate discrete and continuous data, choosing suitable equal class intervals where appropriate # Calculate statistics and select those most appropriate to the problem . # Select, draw and interpret diagrams and graphs, including. frequency diagrams for discrete and continuous data, line graphs for time series, scatter graphs to develop understanding of correlation and back-to-back stem-and-leaf diagrams. # Interpret tables, graphs and diagrams and make inferences to support or cast doubt on initial conjectures; have a basic understanding of correlation. # Compare two or more distributions; make inferences, using the shape of the distributions and appropriate statistics. # Relate results and conclusions to the original question. 2. PROBABILITY # Know that the sum of probabilities of all mutually exclusive outcomes is 1 and use this when solving problems # Find and record all outcomes for two successive events in a sample space diagram. # Understand relative frequency as an estimate of probability and use this to compare outcomes of experiments in a range of contexts.

MYP YEAR 4 MATHEMATICS (STANDARD)							
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Numerical and abstract reasoning

50 sessions @ 40 min | Forms | Representation Approximation | Orientation in space and time

Exploration- Evolution Students will explore the evolution of (rational and irrational numbers) number systems | Representing and approximating quantities in different forms can help explore remarkable discoveries and development | A: Knowing and understanding

D: Applying mathematics in real-life context | Thinking skills Cluster: Critical Thinking Skills

Learner Profiles: Knowledgeable | **Number concept** 1- Different types of numbers 2-Multiples and factors 3- Prime numbers 4- Powers and roots 5- Working with directed numbers 6- Order of operations 7- Rounding numbers **Fraction** 1- Equivalent fractions 2- Operations of fractions 3- Percentages 4- Standard form 5- Your calculator and standard form 6- Estimation **Sequences and sets** 1- Sequences 2- Rational and irrational numbers 3- Sets **Measurements** 1- Understanding units 2- Time 3-Upper and lower bound 4- Conversion graphs 5- More money **Managing money** 1- Earning money 2-Borrowing and investing money 3- Buying and selling **Ratio, Rate and Proportion** 1- Working with ratio 2- Ratio and scale 3- Rates 4- Kinematic graphs 5- Proportion 6- Direct and inverse proportion in algebraic terms 7-Increasing and decreasing amounts in a given ratio |
| Thinking with models

50 sessions @ 40 min | Relationship | Simplification and Model | Scientific and technical innovation **Exploration :** Students will explore the creative way of representing the real life situations like roller coaster, tunnel, bridge, etc using mathematical variables and language. | Relationships in our natural world can be simplified using mathematical models and scientific principles. . | A: Knowing and understanding B: Investigating Patterns C: Communicating D: Applying mathematics in real-life context | Thinking skills Cluster: Critical Thinking Skills Transfer Skills Learner Profile: Thinker | **Basic Algebra** 1-Using letters to represent unknown values 2- Substitution 3- Simplifying expressions 4- Working with brackets 5-Indices **Equations and Transforming formula** 1- Further expansion of brackets 2-Solving linear equations 3-Factorizing algebraic expressions 4- Transformation of the formula 5-Setting up equations to solve problems **Quadratic equations** 1- Expansion 2-Factorize Quadratic expressions **Further solving of equation and inequalities** 1- Simultaneous linear equations 2-Linear Inequalities 3- completing Squares 4- Quadratic formula 5-Factorize quadratics with coefficient of x^2 is not 1 6- Algebraic fractions **Functions** 1- Functions Notations 2- Composite functions 3- Inverse function **Calculus** |

							1.Understand the idea of a derived function. 2. Use the derivatives of functions of the form axn, and simple sums of not more than three of these. 3. Apply differentiation to gradients and turning points (stationary points). 4. Discriminate between maxima and minima by any method
Spatial Reasoning Graphs 50 sessions @ 40 min	Form	Pattern Representation	Scientific and technical Innovation Exploration systems , models and methods Exploring systems , models and methods will enhance knowledge of various function and its application to real life context	Representing patterns with equivalence forms can lead to better systems , models and methods	C: Communicating D: Applying mathematics in real-life context	Thinking skills Cluster: Critical Thinking Skills Transfer Skills Learner Profile: Thinker	**Travel graphs** 1- Cartesian coordinates in two dimensions 2- How to interpret and use graphs in practical situations including travel graphs and conversion graphs 3- How to draw graphs from given data 4-How to find distance travelled from a speed-time graph **Straight Lines** 1- Drawing and recognizing straight line graphs 2-Finding the gradient of a straight line 3- Interpreting the equation $y = mx + c$. 4- Finding the length of a line segment **Curved Graphs** 1- Plotting quadratic, cubic and exponential graphs 2- Plotting reciprocal graphs 3- Using graphs to solve quadratic equations graphically 4- Using graphs to solve simultaneous linear and non-linear graphs 5-Drawing a tangent to a curve 6- Calculating the gradient of the tangent 7-Inequalities **Linear programming** 1- Inequalities and regions in a plane 2- Representing simultaneous inequalities 3- Linear programming and its practical applications Possible connections with Physics eg Travel Graphs and projectile motion

| Reasoning with data 30 sessions @ 40 min | Form | Representation Validity | Orientation in time and space Exploration: Migration | Statistical methods provide a powerful form for analysing and communicating information about global impact of student migration. | A: Knowing and understanding C: Communicating D: Applying mathematics in real-life contexts | Self Management: Organisation skills Research Skill Learner Profile: thinkers | **Statistics** 1- Collecting and classifying data 2- Organizing data 3- Using charts to display data **Averages and measure of spread** 1- Different types of averages 2- Making comparisons using averages and ranges 3- Calculating averages and ranges for frequency data 4- Calculating averages and ranges for group continuous data 5- Percentiles and quartiles **Histogram and frequency Distribution** 1- Histograms with equal and unequal bars 2- Cumulative frequency 3-stem n leaf diagram 4-Box and Whiskers **Scatter diagram and correlation** **Probability** 1- Basic probability 2-Theoretical probability 3- Probability of an event not happening 4- Possibility Diagrams 5- Combining independent and mutually exclusive events 6-Using tree diagram to show outcomes 7-Calculating probability from tree diagrams Connection with Sciences-biology |

MYP YEAR 4 MATHEMATICS (EXTENDED)							
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Thinking with models Functions and Quadratics 90 sessions @ 40 min	Relationships	Simplification and Model	Scientific and technical innovation Exploration- Models, processes - Students will explore the various ways of representing the real life situations using mathematical variables and language.	Relationships in our natural world can be represented using mathematical models and scientific principles	A- Knowing and understanding B - Investigating Patterns C - Communication D - Applying Mathematics to Real life context	Thinking skills Critical thinking Research skills Information Literacy Learner Profile: Knowledgeable Thinker	1-Concept of function, domain, range, one-one function, inverse function and composition of functions 2- relationship between $y = f(x)$ and $y = mod(f(x))$, where $f(x)$ may be linear, quadratic or trigonometric 3-use of sketch graphs to show the relationship between a function and its inverse 4- finding the maximum or minimum value of the quadratic function by any method 5- using the maximum or minimum value of $f(x)$ to sketch the graph or determine the range for a given domain 6- know the conditions for $f(x) = 0$ to have: (i) two real roots, (ii) two equal roots, (iii) no real roots and the related conditions for a given line to (i) intersect a given curve, (ii) be a tangent to a given curve, (iii) not intersect a given curve 7- solve quadratic equations for real roots and find the solution set for quadratic inequalities 8- simple properties and graphs of the logarithmic and exponential functions including ln x and ex 9- the laws of logarithms (including change of base of logarithms) 10 solve equations of the form ax= b 11.Simultaneous equations linear n non linear Connection- Physics - Physical quantities seen as a function with some variables; Projectile motion and the predictions Economics - relationship between cost function, production function, etc. System of Linear equations 1- interpreting the equation of a straight line graph in the form $y = mx + c$ 2- transforming given relationships, including $y = axn$ and $y = Abx$ to straight line form and hence determining unknown constants by calculating the gradient or intercept of the transformed graph 3- mid-point and length of a line. 4- the condition for two lines to be parallel or perpendicular . 5- simultaneous equations in two unknowns with at least one linear equation 6- the remainder and factor theorems. 7- finding factors of polynomials

							8- solving cubic equations. 9- Solving equation established for different physical quantities Connections- Economics - Optimization of the production Physics - Distance time graphs . Biology - predicting linear relation between biological aspects initiated activities.
Numerical and abstract reasoning Indices and surds 25 sessions @ 40 min	Form	Representation Validity	Scientific and technical innovation Exploration- Students will explore the physical measurements around them. They will also explore the real life transactions, conversions and the significance of numbers in life surrounding them.	Representing physical measurements in various forms has helped humans apply their understanding of scientific principles	A- Knowing and understanding C- Communicating	Thinking skills Critical thinking Transfer Learner Profile: Knowledgeable	1- simple operations with indices and with surds, including rationalizing the denominator 2- Solving equations with surds Connection - Chemistry - molar calculations and chemical reactions Physics - calculations with physical quantities
Spatial reasoning Circular measure & Trigonometry 45 sessions @ 40 min	Relationships	Model	Scientific and technical innovation Exploration- Models - Students will explore the application of periodic functions in the natural world	Generalizing relationship between parameters can help in modelling real life phenomena	B- Investigating patterns C- Communicating	Thinking skills Critical and Transfer skills Learner Profile: Inquirer Communicator	1- the arc length and sector area of a circle, including knowledge and use of radian measure 2- the six trigonometric functions of angles of any magnitude (sine, cosine, tangent, secant, cosecant, cotangent) 3- amplitude and periodicity and the relationship between graphs of e.g. $\sin x$ and $\sin 2x$ 4- the graphs of : $y = a \sin (bx) + c$, $y = a \cos (bx) + c$ $y = a \tan (bx) + c$, where a and b are positive integers and c is an integer. 5- using the relationships and solving simple trigonometric equations involving the six trigonometric functions and the above relationships (not including general solution of trigonometric equations) 6- proving simple trigonometric identities Connection- Physics - Wave functions and periodic functions

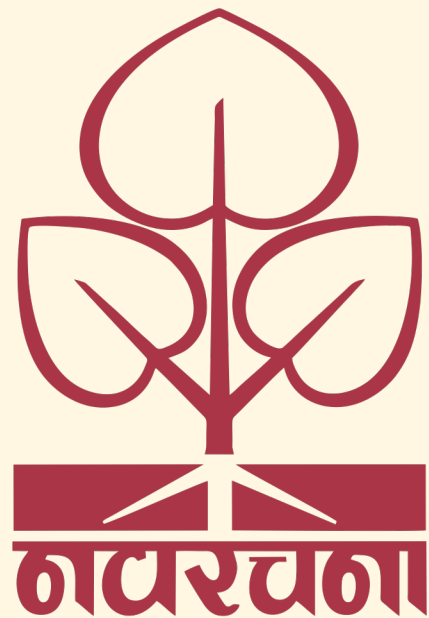| MYP YEAR 5 MATHEMATICS (STANDARD)							
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Spatial reasoning Geometry 1 70 sessions @ 40 min	Relationship	Approximation and model	Globalization and Sustainability Exploration- Students will explore the space around them in terms of architectural structures and appreciate the application of geometry in constructing the complex attractive global structures.	Generalizing relationship between dimensions and its approximate measurements can lead to model the real life structures better.	A: Knowing and understanding D: Applying mathematics in real-life contexts	Thinking skills Cluster Critical and Transfer Thinking skills Learner Profile: Thinker	Symmetry 1-Recognize rotational and line symmetry (2D & 3D) 2- Know properties of triangles, quadrilaterals and circles directly related to their symmetries. 3- Recognize symmetry properties of the prism and pyramid 4- Use the symmetry 5- properties of circles 6- Constructions of triangle, quadrilateral, perpendicular bisector and angle bisector. 7- Constructing shapes and Scale Drawing Possible connection is with Visual Arts…eg. Geometrical patterns observed in various textiles, flooring, monuments, etc. Lines, angles and shape 1- Lines and angles 2-Triangles, Quadrilaterals and Polygons 3- Circles Mensuration 1. Carry out calculations involving the perimeter and area of a rectangle, triangle, parallelogram, rhombus and trapezium. 2. Carry out calculations Surface area and Volume of a Cube, Cuboid, Prism, Cone, Cylinder, Sphere, Hemisphere and Pyramids. 3. Carry out calculations involving Circumference and area of a circle. 4. Solve problems involving the arc length and sector area as fractions of the circumference and area of a circle. 5.Carry out calculations involving areas and shapes of compound shapes Geometrical shapes and relationships 1-Measuring and drawing angles 2-Bearings 3-Congruent shapes and triangles 4- Similar shapes 5-Areas and volumes of similar shapes .

Spatial reasoning Trigonometry 30 sessions @ 40 min	Relationship	Models	Scientific and Technical Innovation Exploration Students will explore the impact of scientific and technological advances on communities and environments How humans use their understanding of scientific principles? Example-Hidden triangles , drone camera application	Modelling allows us to solve new spatial relationship problems arising from technical innovation	A: Knowing and understanding B: Investigating Patterns C: Communicating D: Applying mathematics in real-life contexts	Thinking skills Cluster Critical and Transfer Thinking skills Learner Profile: Thinker	Trigonometry & Application 1- Pythagoras' theorem 2- Trigonometric Ratios 3- Sine, cosine and tangent ratios for acute angles to the calculation of a side or an angle of a right angled triangle, Solve trigonometrically problems in two dimensions involving angles of elevation and depression. 4- Solving problems using trigonometry, Extend sine and cosine functions to angles between 90° and 360° 5- Solve problems using the sine and cosine rules for any triangle, formula for area of triangle. 6- Solve simple trigonometrically problems in three dimensions including angle between a line and a plane
Spatial reasoning Geometry 2 70 sessions @ 40 min	Logic	Space	Personal and cultural Expressions Explorations - Students will explore Geometric and spatial relationships being used around us	Applying mathematical logic to spatial dimensions can open personal ,cultural and social entrepreneurship opportunities	A: Knowing and understanding C: Communicating D: Applying mathematics in real-life contexts	Thinking skills Cluster Critical and Transfer Thinking skills Learner Profile: Thinker	Lines -1-Cartesian coordinates /plane ,types of lines,2- length between two points ,3-Midpoint , 4-Gradient ,5-perpendicular lines and parallel lines 6-Constructions of perpendicular and parallel lines. Vectors 1- Describe a translation by using a vector 2- Add and subtract vectors and multiply a vector by a scalar 3- Calculate the magnitude of a vector 4- Represent vectors by directed line segments 5- Use the sum and difference of two vectors to express given vectors in terms of two coplanar vectors 6- Use of position vectors Possible connections with Physics eg magnitude and direction of displacement, velocity, acceleration. Transformations 1.Reflect simple plane figures in horizontal or vertical lines 2- Rotate simple plane figures about the origin, vertices or mid-points of edges of the figures, through multiples of 90 3- Construct given translations and enlargements of simple plane figures 4- Recognize and describe reflections, rotations, translations and enlargements 5- Use reflection, rotation, translation, enlargement, and their combinations 6- Identify and give precise descriptions of transformations connecting given figure.

MYP YEAR 5 MATHEMATICS (EXTENDED)							
Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject group objectives	ATL skills and LP	Content (topics, knowledge, skills)
Reasoning with data Permutations and combinations And Series 50 sessions @ 40 min	Relationships	Patterns Generalization	Fairness and Development Exploration- Students will explore the real life scenario related to the arrangements for the objects with conditions.	Developed patterns based on generalized relations can lead to better models of mathematics in world around us	A- Knowing and understanding D- Applying Mathematics to Real Life context	Thinking skills Critical Thinking Skills Transfer Skills Learner Profile: Knowledgeable Thinker	Permutations and combinations 1- distinguishing between a permutation case and a combination case 2- the notation n! (with 0! = 1), and the expressions for permutations and combinations of n items taken r at a time 3- simple problems on arrangement and selection(cases with repetition of objects, or with objects arranged in a circle, or involving both permutations and combinations, are excluded) Series 1- Use the Binomial Theorem for Expansion of $(ax+b)^n$ for positive integer n 2- use of the general term (n,r,a,b) (knowledge of the greatest term and properties of the coefficients is not required) 3. Recognise arithmetic and geometric progressions 4. Use the formulae for the nth term and for the sum of the first n terms to solve problems involving arithmetic or geometric progressions 5. Use the condition for the convergence of a geometric progression, and the formula for the sum to infinity of a convergent geometric progression
Spatial reasoning Vectors in 2 dimensions 30 sessions @ 40 min	Form	Representation and Systems	Orientation in space and time Exploration- Students will appreciate the contribution of vectors in establishing the finer air, land or water routes for/across the vast geographical quantities on the map over the years.	Generalised relationship between the mathematical systems will help in sophisticated solutions for the real life problems over time.	A- Knowing and understanding D- Applying mathematics in real-life contexts	Thinking skills Critical Transfer Learner Profile: Thinker	1- Different forms of vectors, use of position vectors and unit vectors. • finding the magnitude of a vector; adding and subtracting vectors and multiplying vectors by scalars 2- composing and resolving velocities 3- use of relative velocity, including solving problems on interception connection- with science (physics) Vector and Scalar quantities

Thinking with models Calculus 80 sessions @ 40 min	Relationships	Model Representation	Scientific and technical innovation Exploration- Application of mathematical concepts of optimization problems, connected rates of change, kinematics etc	Using scientific and innovative model to represent a relationship can produce better mathematical solutions	A- Knowing and understanding B- Investigating Patterns C- Communicating D- Applying mathematics in real-life contexts	Research skills Information Literacy Social skills Collaboration Thinking skills Critical Thinking Skills Transfer Skills Learner Profile: Thinker Knowledgeable	1- Understand the idea of derived function 2- use of notations 3- Use of derivatives of the standard functions and composite functions 4- Differentiate products and quotients of functions 5- Apply the Differentiation to gradients, tangents and normals, stationary points, connected rates of change, small increments and approximations and practical maxima and minima problems 6- Use of first derivative and second derivative test to discriminate between maxima and minima 7- Understand integration as the reverse process of differention 8- Integrate sums of terms in powers of x excluding $1/x$ and $1/(ax+b)$ 9- Integrate functions of the form $(ax+b)^n$ $\sin(ax+b)$, $\cos(ax+b)$, $e^{(ax+b)}$ 10- Evaluate definite integrals and apply integration to the evaluations of plane areas 11- Apply differentiation and integration to Kinematics problems that involve displacement, velocity and acceleration of a particle moving in a straight line with variable or constant acceleration and the use of X-t and V - t Graphs connection- Physics- Kinematics Economics - Optimisation problems

नवरचना

The Navrachana logo comprises three leaves of the Bodhi tree under which Lord Buddha attained enlightenment. The leaves signify the three vital facets of the child's physical, mental-emotional growth, and development. This translates as Navrachana, which is "New Creation".

The emblem thus symbolizes the aim of the school, which is to build, nurture, and groom these three qualities, to create well-balanced and multifaceted individuals who consistently strive to realize their true potential