



INTERNATIONAL SCHOOL
LUXEMBOURG

IB mission statement

The International Baccalaureate aims to develop **inquiring, knowledgeable and caring** young people who help to create a better and more peaceful world through intercultural understanding and respect.

To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.

These programmes encourage students across the world to become **active, compassionate and lifelong learners** who understand that other people, with their differences, can also be right.



The MYP:

- addresses holistically students' **intellectual, social, emotional and physical well-being**
- provides students opportunities to develop the **knowledge, attitudes and skills** they need in order to manage complexity, and take responsible action for the future
- ensures breadth and depth of understanding through study in **eight subject groups**
- requires the study of at least **two languages** to support students in understanding their own cultures and those of others
- empowers students to participate in **service with the community**
- helps to prepare students **for further education, the workplace and a lifetime of learning.**

This curriculum is subject to change and may be adapted to suit the needs and interests of the students and adapted to fit appropriately in accordance with best practice and circumstances.

SUBJECT GROUP 5 MATHEMATICS

The study of mathematics is a fundamental part of a balanced education. It promotes a powerful universal language, analytical reasoning and problem-solving skills that contribute to the development of logical, abstract and critical thinking. Mathematics can help make sense of the world and allows phenomena to be described in precise terms. It also promotes careful analysis and the search for patterns and relationships, skills necessary for success both inside and outside the classroom. Mathematics, then, should be accessible to, and studied by, all students.

MYP mathematics are to encourage and enable students to:

- enjoy mathematics, develop curiosity and begin to appreciate its elegance and power
- develop an understanding of the principles and nature of mathematics
- communicate clearly and confidently in a variety of contexts
- develop logical, critical and creative thinking
- develop confidence, perseverance, and independence in mathematical thinking and problem-solving
- develop powers of generalization and abstraction
- apply and transfer skills to a wide range of real-life situations, other areas of knowledge and future developments
- appreciate how developments in technology and mathematics have influenced each other
- appreciate the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics
- appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives
- appreciate the contribution of mathematics to other areas of knowledge
- develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics.
- develop the ability to reflect critically upon their own work and the work of others.

Skills and Understanding / Goals :

Students should be able to:

- know and use mathematics in a variety of contexts (including authentic real-life situations).
- develop investigation skills through looking at patterns in mathematics.
- communicate effectively through the language of mathematics

Skills: Communication, Collaboration, Organization Skills, Affective skills, Reflection, Research-Information literacy and Media literacy skills, Critical and Creative thinking skills and

Transfer skills.

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| <p>Year 6</p> | <p>Numbers and number systems Mathematical operations and properties Numerical expressions /equations Problem solving Algebraic expressions and real-life situations. Simplifying algebraic expressions Solving equations. Data(Primary,Secondary,Quantitative, qualitative) Representing data (graphs) Mode, Median, Mean and range Analyzing data and drawing conclusions The metric system and conversions Measurement and estimations Scale drawings Angles, triangles and circles Area and perimeter of Composite figures Generalisation in Mathematics Venn diagrams</p> |
| <p>Year 7</p> | <p>Percentages, Decimals, and Ratios Proportional reasoning and logic 2D and 3D Shapes Angles, triangles, polygons and circles Area formula. Nets and surface area Geometrical constructions Volume of 3D shapes Types of data Collecting and organising data Data representation Infographics and data visualisations Analysing data Cumulative frequency Quartile data and box-and-whisker plots. Central tendency-Correlation. Cartesian plane: Points, x- and y-coordinates relationship and equations Transformations :reflection, rotation, translation and enlargement Expansion and factorization Expressions and solving equations The binary number system</p> |
| <p>Year 8</p> | <p>The development of numbers</p> |

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| | <p> Concepts in algebra Order of Operations. Radicals,Powers,absolute values Venn diagrams and sets Linear relations/equations Straight line forms Linear equations and graphs in real-life problems Games/riddles/puzzles and logic in mathematics Networks-Flowcharts Decision trees/algorithms Probability Calculation of simple probabilities. Independent and dependent events Fundamental counting principle Experimental probability Pythagoras' theorem Trigonometric ratios: Sine, cosine and tangent The use of the trigonometric ratios </p> |
| <p>Year 9</p> | <p> Numbers and number sets Standard form and scientific notation. Operations with radicals and exponents Rounding to dp and sf. Simple logarithms Expanding brackets Evaluating expressions Factorization and simplification. Quadratic expressions. Linear equations: $y=mx+c$ and $ax+by+c=0$ forms Desmos graphing calculator Simultaneous equations Real-life problems Venn diagrams Pythagoras' theorem Pythagorean triples 3D shapes. Trigonometric ratios: $\sin\theta$, $\cos\theta$ and $\tan\theta$. Real-life problems Sine and cosine rule Radians Line segments-Midpoints Vertical and horizontal lines Parallel and perpendicular lines Vectors and operations 3D vectors Data collection and interpretation Mean, mode and median. Cumulative frequency </p> |

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| | <p>Measure of spread: range, Q1 and Q3 quartiles, interquartile range and box-and-whisker plot . Correlation Standard deviation</p> |
| <p>Year 10</p> | <p>Solving -first degree -inequalities, compound and double inequalities. Linear inequalities and real life problems. Simultaneous inequalities and linear optimisation, apply to real life problems Sequences/ Series. Finding general rules for sequences. Arithmetic and Geometric sequence, real life problems. Fibonacci sequence. Quadratic functions: $y=ax^2+bx+c$. Graphing and solving quadratic functions by :Factorization $y=k(x-a)(x-b)$, completing the square $y=k(x-a)^2+b$ and using the discriminant $\Delta= b^2-4ac$. Optimization problems using quadratics Functions: notation, mapping, function machines, functions in algebraic form and graphical representation of functions. Range and domain of a function. Linear, quadratic and cubic functions. Exponential function: Exponential growth and decay. Predictions and interpretations. Correlation. Finding the line of best fit. Circle and parts of a circle: centre, diameter, radius, chord, tangent and secant lines, arc, chord. Semicircle, sector, segment of a circle. Right-angled triangles inscribed in a circle. Angles subtended by the same arc are equal and Central angle theorem, problem solving situations. Circumference of a circle, area of a circle. Length of an arc and the area of a sector of a circle. Relative position of a straight line and a circle. Cyclic quadrilateral: Angles subtended by a diameter, opposite angles and angle between a tangent and a radius of a circle. Trigonometric functions and circles: Sine, cosine and tangent functions. Trigonometric identities and proofs. Probabilities: universal set Ω, probability of an event. Venn diagrams and sample spaces. Complementary events. Experimental and theoretical probability. Tree diagrams and the 2-way table. Independent and conditional (dependent) probability. Rules of probabilities. Revision of all topics</p> |