



Enseignement secondaire		
Classes internationales		
	Régime anglophone	
Mathématiques		
Programme		
5IEC		

Leçons hebdomadaires: 4		
Langue véhiculaire: anglais		
Nombre minimal de devoirs en classe: 7 par année / 2 par trimestre		

General comments

Students are expected to be familiar with the mathematical skills required for the admission to year 9 (5IEC). The aim of the course is to prepare for the study of mathematics in year 10 (4IEC).

Numerical and algebraic reasoning

The ability to work with numbers and symbols is an essential skill in mathematics. Students are expected to have an understanding of number concepts and to develop the skills of calculation and approximation. Algebra uses letters and symbols to represent numbers, quantities and operations, and employs variables to solve mathematical problems. Algebra is an abstraction of the concepts first used when dealing with numbers and is essential for further learning in mathematics.

Algebra	Chapter 1
Review from year 8: <ul style="list-style-type: none">- Algebraic notation- Evaluating algebraic expressions- Collecting like terms- Algebraic products	
Notes: <ul style="list-style-type: none">- Add exercises in which algebraic sums and products are mixed (similar to Exercise 1D 3), including distributivity and FOIL rules.	
Indices	Chapter 2
<ul style="list-style-type: none">- Evaluating indices- Index laws- Scientific notation	
Notes: <ul style="list-style-type: none">- Rational indices are treated in year 10	



- Add more complex exercises in which all different index laws are mixed (some for which the bases are variables, some for which the bases are integers) and alternate between negative and positive bases	
Sets and Venn diagrams	Chapter 3
<ul style="list-style-type: none">- Sets (merge chapters 2A and 2C from MYP 3 with chapter 3A from MYP 4)- Special number sets- Interval notation- Complement of a set- Venn diagrams- Problem solving with Venn diagrams <p>Notes:</p> <ul style="list-style-type: none">- Additional exercises to be added by the teacher	
Algebraic expansion	Chapter 4
<p>Review from year 8:</p> <ul style="list-style-type: none">- The distributive law- The product $(a+b)(c+d)$- Difference of two squares- Perfect square expansion- Further expansion <p>Notes:</p> <ul style="list-style-type: none">- Add Pascal's triangle- Additional exercises to be added by the teacher (mixing all expansion methods, including fractions)	
Radicals	Chapter 5
<ul style="list-style-type: none">- Radicals and surds- Simplifying radicals- Simplest radical form- Adding and subtracting radicals- Multiplications involving radicals- Division by radicals <p>Notes:</p> <ul style="list-style-type: none">- Add MYP 3 – Chapter 10A	
Quadratic factorisation	Chapter 9
<ul style="list-style-type: none">- Removing common factors- Difference of two squares factorisation- Perfect square factorisation- Factorising expressions with four terms- Factorising quadratic trinomials- Factorising quadratics <p>Notes:</p> <ul style="list-style-type: none">- Add MYP 3 – Chapter 19	



- Additional exercises to be added by the teacher	
Algebraic fractions	Chapter 11
<ul style="list-style-type: none">- Evaluating algebraic fractions- Simplifying algebraic fractions- Multiplying algebraic fractions- Dividing algebraic fractions- Adding and subtracting algebraic fractions	
Notes: <ul style="list-style-type: none">- Necessary conditions to be added- Additional exercises to be added by the teacher	
Quadratic equations	Chapter 18
<ul style="list-style-type: none">- Equations of the form $x^2=k$ (Review from chapter 5)- The null factor law (Review from chapter 5)- Solution by factorisation- Completing the square- Problem solving	
Notes: <ul style="list-style-type: none">- Add MYP 3 – Chapter 21- Additional exercises to be added by the teacher	

Spatial reasoning

Spatial reasoning skills provide students with the tools for analysing, measuring and transforming geometric quantities in two dimensions.

The topics and skills in spatial reasoning will help students develop an understanding of

- construction and manual skills,
- visualization of 2D shapes
- transformation of shapes

Transformation geometry	Chapter 16
<ul style="list-style-type: none">- Translations- Reflections- Rotations- Enlargements and reductions	
Pythagoras' theorem	
<ul style="list-style-type: none">- MYP 3, Chapter 10C, 10D and 10E (Pythagoras' theorem)- MYP 5, Chapter 4	



Reasoning with data

This branch of mathematics is concerned with the collection, analysis and interpretation of quantitative data and uses the theory of probability to estimate parameters, discover empirical laws, test hypotheses and predict the occurrence of events.

Through the study of statistics, students should develop skills associated with the collection, organization and analysis of data, enabling them to present information clearly and to discover patterns. Students will also develop critical-thinking skills, enabling them to differentiate between what happens in theory (probability) and what is observed (statistics).

Students should understand both the power and limitations of statistics, becoming aware of their legitimate use in supporting and questioning hypotheses, but also recognizing how statistics can be used to mislead as well as to counter opinions and propaganda.

Probability	Chapter 14
<ul style="list-style-type: none">- Experimental probability- Probabilities from tabled data- Sample space- Theoretical probability- Using 2-dimensional grids- Compound events- Using tree diagrams- Sampling with and without replacement- Probabilities from Venn diagrams- Expectation-	

Effective use of information and communication technology in mathematics

The appropriate use of computers, computer applications and calculators can improve the understanding of all students. In year 9, students are expected to write their first *mathematical investigation*.

A mathematical investigation is a short report written by the student. The emphasis is on mathematical communication (including formulae, diagrams, graphs and so on), with accompanying commentary, good mathematical writing and thoughtful reflection. A student should develop his or her own focus, with the teacher providing feedback. This will allow the students to develop an area of interest for them, without a time constraint as in an examination, and will allow all to experience a feeling of success.

In addition to testing the objectives of the course, the mathematical investigation is intended to provide students with opportunities to increase their understanding of mathematical concepts and processes, and to develop a wider appreciation of mathematics.

It is intended that, by working on the mathematical investigation, students benefit from the mathematical activities undertaken and find them both stimulating and rewarding. It will enable students to acquire the attributes of the IB learner profile.

One of the objectives is to use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.



Examples include:

- Any kind of calculators, the internet, data logging devices
- Word processing packages, spreadsheets, graphics packages

The paper will be written in Microsoft Word possibly using spreadsheet functions from Microsoft Excel and/or the use of GeoGebra.

In year 9 students write one *mathematical investigation*.

Textbook

Haese and Harris Publications

Mathematics for the international student 9 (MYP 4) – Second edition

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Planning the curriculum

Here's a possible order to sequence the individual chapters.

1. MYP 4 – Chapter 1 – Algebra
2. MYP 4 – Chapter 2 – Indices
3. MYP 4 – Chapter 4 – Algebraic expansion
4. MYP 4 – Chapter 5 – Radicals
5. MYP 4 – Chapter 9 – Quadratic factorisation
6. MYP 4 – Chapter 18 – Quadratic equations
7. Pythagoras' theorem
8. MYP 4 – Chapter 11 – Algebraic fractions + necessary conditions
9. MYP 4 – Chapter 16 – Transformation geometry
10. MYP 4 – Chapter 14 – Probability (Introduction)

Calculator

Casio FX-991 EX