

GROUP 5

Mathematics

All students must study one of the Maths options below. In addition, students may opt to take Computer Science as an elective in Group 6, instead of an Arts subject.

POSSIBLE OPTIONS IN MATHEMATICS

Mathematical Studies (Standard Level)

Mathematics (Standard Level)

Mathematics (Higher Level)



WHAT ARE THE AIMS OF THE COURSE?

In all the levels of Mathematics, it is the intention that students will:

- know and use mathematical concepts and principles
- know and use appropriate notation and terminology
- understand the significance of results
- recognise patterns and structures and make generalisations
- use appropriate technological devices as mathematical tools.

THREE DIFFERENT COURSES WITH THREE DIFFERENT AIMS

Mathematics is a compulsory part of the International Baccalaureate, but since individual students have different needs, interests and abilities, a number of different programmes are offered. You can study Mathematics at either Standard Level or Higher Level. At Standard Level there are two different options, Mathematical Studies and Mathematics. Each programme is designed to meet the needs of a particular group of students and therefore great care should be exercised in selecting the one which is the most appropriate. It is important to discuss this selection with a Mathematics teacher in order to make the correct decision.

The IB Mathematics courses are designed to be challenging and interesting. They build on work you will have met at IGCSE, but also introduce you to new ideas that some of the greatest minds of the millennium have produced. They serve as a very useful support for many other qualifications as well as being a sought after qualification for the workplace and courses in higher education.

WHO IS THE COURSE SUITABLE FOR?

Standard Level – Mathematical Studies

This course caters for students of varied backgrounds and abilities. It reinforces work done at IGCSE level and concentrates on the type of Mathematics which can be applied to a variety of contexts, including general world occurrences and topics that relate to home, work and leisure situations. More specifically, the course is designed to build confidence and encourage an appreciation of Mathematics in students who



probably do not anticipate a need for Mathematics in their future studies. However, many universities do consider it an advantage to have studied Mathematics throughout Years 12 and 13, and this course includes introductory Calculus which satisfies the mathematical requirements for some tertiary courses. This course will be taught in 2 periods a week. Please consult with the Careers Staff to determine the suitability of this course for entrance to your selected tertiary institution.

Standard Level - Mathematics

This course is considerably more demanding than Mathematical Studies. You will need at least a Grade B in Mathematics at IGCSE as the course relies on a good knowledge and understanding of all the algebraic skills learned previously and builds upon these by developing new techniques to provide an insight into how the world of mathematics is constructed. Students will be encouraged to apply the mathematical knowledge they have learned to solve meaningful problems set in an appropriate context. It caters for students who anticipate a need for a sound mathematical background in preparation for their future studies.

Students most likely to select this course will be those who expect to go on to study subjects which have a significant mathematical content, for example Chemistry, Economics, Geography, Psychology and Business Administration. The course will be taught in 2 periods a week.

Higher Level – Mathematics

Mathematics Higher Level caters for students with a strong background in Mathematics who are highly competent in a range of analytical and technical skills. Students will be expected to have previously gained a Grade A or A* (or equivalent) for Mathematics at IGCSE. Please note that a high grade at IGCSE does not guarantee success on this demanding course. The course focuses on developing important mathematical concepts in a comprehensive and coherent way. Students are encouraged to apply their mathematical knowledge to solving problems set in a variety of meaningful contexts whilst, at the same time, being introduced to the important concepts of rigour and proof.

The majority of students who select this course will be expecting to include Mathematics as a major component of their university studies, either as a subject in its own right or within courses such as Physics, Engineering and Technology. Others may take this course because they have a strong interest in Mathematics and enjoy meeting its challenges and engaging its problems. The HL syllabus is very demanding; acceptance onto this course is fully at the discretion of the Mathematics Department. This course will be taught in 3 periods per week.

WHAT TOPICS WILL BE STUDIED?

Mathematical Studies – Standard Level

Number & Algebra	Graphs & Linear Equations	Logic & Probability
Statistics	Trigonometry	Calculus
Sequences & Series	Functions	Financial Mathematics

Mathematics – Standard and Higher Level

Algebra	Vectors
Functions and Equations	Statistics and Probability
Trigonometry	Calculus

Both **SL and HL** offer the same topics, but each topic is studied to a greater depth in the Higher Level course. In addition, students of Higher Level Mathematics study an additional option topic which is Statistics. This is examined by an additional paper for Higher Level only (see below).

HOW WILL STUDENTS BE ASSESSED?

Standard Level – Mathematical Studies

The final examination is worth 80% of your grade. There are 2 papers, each of length 1½ hours. The first contains shorter questions and the other more extended problems. The papers are equally weighted (40% each) and both require you to effectively use the Ti-Nspire graphical calculator.

Mathematical Studies also contains a project worth 20%. In the project, students are encouraged to choose a topic of personal interest and to undertake a mathematical investigation using skills learned before and during the course. This allows you to achieve a significant part of your grade before the end of the course. Students will learn about this coursework during the course of Year 12, and will look at previous projects as well as the criteria for assessment.

It is likely that the project itself will be completed towards the end of Year 12, when students can demonstrate understanding and application of the skills and knowledge they have gained from this course, particularly in Statistics. The project is marked by your Mathematics teacher and moderated by the IBO.

Students who fail to submit a completed project will automatically fail this course, as stipulated by IBO. Failing this course will prevent Diploma students from achieving their Diploma, and it is therefore very important that all students submit a completed project.

Standard Level – Mathematics

The final examination is worth 80% of your grade, divided equally between two papers of 1½ hours each. No calculator of any type is permitted for the first paper, and the second requires extensive use of a Ti-Nspire graphical calculator.

The course will also include an ‘exploration’ which is an independent piece of mathematical work and it is worth 20% of the final grade. Students are expected to undertake work of an independent nature, providing an opportunity to demonstrate ability without the constraints of a written examination. The ‘exploration’ will be marked by your Mathematics teacher and moderated by IBO.

Students who fail to submit a portfolio will automatically fail this course, as stipulated by IBO. Failing this course will prevent students from achieving their Diploma, and it is therefore very important that all students submit a completed portfolio.

Higher Level – Mathematics

the assessment for this course is very similar to standard level (above). the only difference is an additional paper 3 (statistics option). this affects the weighting of examination papers so that paper 1 (2 hours, no calculator) and paper 2 (2 hours, ti-nspire required) are each worth 30% and paper 3 (1 hour, statistics, with ti-nspire) is worth 20%. the remaining 20% comes from internal assessment in the form of an ‘exploration’ as described for standard level above.