IB Math Studies Year 1 Course Overview

Course Title: International Baccalaureate (IB) Math Studies – Year 1
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Course Description: This course is available only at standard level, and is equivalent in status to mathematics SL, but addresses different needs. It has an emphasis on applications of mathematics, and the largest section is on statistical techniques. It is designed for students with varied mathematical backgrounds and abilities. It offers students opportunities to learn important concepts and techniques and to gain an understanding of a wide variety of mathematical topics. It prepares students to be able to solve problems in a variety of settings, to develop more sophisticated mathematical reasoning and to enhance their critical thinking. The individual project is an extended piece of work based on personal research involving the collection, analysis and evaluation of data. Students taking this course are well prepared for a career in social sciences, humanities, languages or arts. These students may need to utilize the statistics and logical reasoning that they have learned as part of the mathematical studies SL course in their future studies.

Course Aims: The aims of all IB diploma program mathematics courses are to enable students to:
1. enjoy mathematics, and develop an appreciation of the elegance and power of mathematics
2. develop an understanding of the principles and nature of mathematics
3. communicate clearly and confidently in a variety of contexts
4. develop logical, critical and creative thinking, and patience and persistence in problem-solving
5. employ and refine their powers of abstraction and generalization
6. apply and transfer skills to alternative situations, to other areas of knowledge and to future developments
7. appreciate how developments in technology and mathematics have influenced each other
8. appreciate the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics
9. appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives
10. appreciate the contribution of mathematics to other disciplines, and as a particular "area of knowledge" in the TOK course.

Course Objectives: Problem-solving is central to learning mathematics and involves the acquisition of mathematical skills and concepts in a wide range of situations, including non-routine, open-ended and real-world problems. Having followed a DP mathematical studies SL course, students will be expected to demonstrate the following.
1. **Knowledge and understanding**: recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
2. **Problem-solving**: recall, select and use their knowledge of mathematical skills, results and models in both real and abstract contexts to solve problems.
3. **Communication and interpretation**: transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardized notation.
4. **Technology**: use technology, accurately, appropriately and efficiently both to explore new ideas and to solve problems.
5. **Reasoning**: construct mathematical arguments through use of precise statements, logical deduction and inference, and by the manipulation of mathematical expressions.
6. **Investigative approaches**: investigate unfamiliar situations involving organizing and analysing information or measurements, drawing conclusions, testing their validity, and considering their scope and limitations.

Texts & Resources: We will use one primary source as our text. Other materials will be used as needed.

Haese & Harris: (*Mathematical Studies SL, Third Edition*). The text will be provided and an electronic copy with tutorial support is available by CD or the text only is at http://www.aleigonzalez.org/Desert/ibssl-3.pdf.
http://aleimath.blogspot.com - My web page is updated regularly. It has homework assignments, class notes, and other resources. Bookmark it and use it regularly.

Syllabus: The IB Standard Level Math program is generally studied over two years – this course is the first of the two. Detailed content from each area and the exploration is given in the syllabus published by IB which is available at http://www.aleigonzalez.org/Desert/math.studies.14.pdf. **Students should download this and keep it for reference over the course of their study.**

It is expected that students in Year 1 are fairly well versed in topics from Algebra 2 and any other topics in the Prior Learning section of the syllabus. In this course we will study topics 1,2,4 & 6 (Numbers and Algebra, Statistics, Statistical Applications and Modeling) and get a good start on the Project. In Year 2 we will finalize our Projects and cover topics 3, 5, & 6 (Logic, Geometry & Trig, and Calculus), while we will review and extend our understanding of the other topics.

A summary of the Math Studies areas of study with the approximate time allocated to each area is shown.

	Topic	Hrs	Notes
Topic 1	**Numbers & Algebra**	**20**	**Year 1**
Topic 2	**Descriptive Statistics**	**12**	**Year 1**
Topic 3	Logic, Sets, & Probability	20	Year 2
Topic 4	**Statistical Applications**	**17**	**Year 1**
Topic 5	Geometry & Trigonometry	18	Year 2
Topic 6	**Modeling**	**20**	**Year 1**
Topic 6	Calculus	18	Year 2
	Project	**25**	**Draft completed Year 1** Final completed Year 2
	Total	**150**	

Methods of Assessment: Students will be assessed using both summative and formative assessments. Tests, quizzes, projects and regular oral and written problem presentations will be assessed.

IB Project: All students, whether or not they are candidates for an IB certificate, will be expected to complete the IB project. This is a short (no more than 2000 words, excluding diagrams, graphs, appendices & bibliography) report written by the student based on a topic chosen by him or her, and it should focus on the mathematics of that particular area. 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 via, for example, discussion and interview. A draft of the project, worth 20% of your Desert grade, will be completed in the first year.

Late work policy: It is expected that assignments will be completed, turned in on time, and represent the student's own work. Timely completion of assignments is essential to ensuring strong class participation and optimal learning outcomes. At the discretion of the teacher, late work may be marked down 20% (one full grade.) Teachers may also, at their discretion, refuse to accept late work if it is more than10 days overdue; in such cases, the assignment may be given an 'F.'.

Grading Policy: Your grade will be based on problem presentations, quizzes, and tests (80%), and your Project draft (20%). Problem presentations and homework will be graded for completeness and accuracy but your grade in the course will be primarily based on your performance on quizzes and tests. These will be scored according to an IB 0-7 grading scale. At the end of each semester, a composite IB grade based on tests and quizzes will be determined. When students are on a border, their homework completion, problem presentations, and class participation will be taken into consideration. A Desert letter grade will then be assigned according to the following mapping:

7 = A+ 6 = A 5 = A- 4 = B+ 3 = B- 2 = C- 1 = D- 0 = F

Homework Policy: Because math is best learned through regular practice, expect to have nightly homework. Unless otherwise indicated, homework is due at the beginning of the following class period. In most cases, you will be presenting one or more homework problems during class. **Homework presentations and work in class represent a significant part of your learning – doing the HW well and contributing in class is essential for your success.** The remaining problems will be spot checked for completion and collected on a random basis for explicit grading. Be prepared to hand in any homework assignment.

Absences and Tardies: Please refer to the school's absentee and tardy policies in the 2013-14 Parent Student Handbook. Note that as students arrive to class, they will select the problem(s) they wish to present on a first come, first served basis so it is to your advantage to arrive to class on time. If you are absent, you are responsible for making up the missed material on your own time. In general missed HW is due one day following your return from an absence. It is your responsibility to schedule a time to make up missed tests or quizzes. A student who is absent 5 times in one semester will receive written notification of excessive absences. A student who is absent 8 or more times may be required to complete work outlined in a written make-up plan in order to receive credit for the course.

Required Materials: Students are expected to bring the following materials to class **every day**.

- Text book (if class sets are not available)
- Math notebook. I **strongly** suggest a **graph paper notebook**, available at Staples or through me for about $3
- 3 Ring binder to help organize handouts and submitted work that has been returned to you.
- **Graphing calculator**. (TI-84Plus or TI-nSpire (**non-CAS**) recommended). Note: If you borrow a school calculator on a regular basis you may be assessed a rental fee at the end of the year. The fee will be calculated by dividing the total replacement cost of lost or negligently damaged calculators by the number of regular borrowers. Note that this fee may apply **even if you return the calculator you borrowed in good working order.**
- At least two **pencils** with good erasers.
- There is generally a class set of rulers, protractors, compasses, etc, but having your own is convenient.

Student:

I have read the entire attached course overview. Specifically, **I understand that if I borrow a school calculator on a regular basis I may be financially responsible for a rental fee to be determined at the end of the year based on the total number of lost or damaged calculators.** I agree to adhere to the policies contained within. I agree to give this class my best effort and to respect everyone within it.

_____ _____ _____

Student Name (please print) Student Signature Date

Parent/Guardian:

I have read and reviewed the attached course overview with my student and agree to adhere to the policies contained within. Specifically, **I understand that if my child borrows a school calculator on a regular basis I may be financially responsible for a rental fee to be determined at the end of the year based on the total number of lost or damaged calculators.**

_____ _____ _____

Parent Name (please print) Parent Signature Date

Three things I would like you to know about my child:

1.) _____

2.) _____

3.) _____

Please check if the statement below if it applies to you and your student (will be kept confidential):

_____ We do not have internet/email access at home.