MYP 5 Math - Course Overview

Course Title: International Baccalaureate (IB) Middle Years Program Year 5
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Course Description: This course is designed specifically for students who took Algebra 2 as 8th or 9th graders in the 2012-13 school year but who have not yet had a geometry course. Its goal is to cover the fundamentals of geometry while reviewing algebra principles in preparation for one of the IB Diploma Program math courses. The materials covered will be customized to these students and while the course is called MYP5, we will be drawing on principles from texts designed for MYP 2, 3, 4, and 5.

Course Aims: The aims of any MYP subject state in a general way what the teacher may expect to teach or do, and what the student may expect to experience or learn. In addition, they suggest how the student may be changed by the learning experience.

The aims of the teaching and study of MYP mathematics are to encourage and enable students to:

- Enjoy mathematics and to develop curiosity as well as an appreciation of 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, and patience and persistence in problem solving
- Develop power of generalization and abstraction
- Apply and transfer skills to a wide range of situations including real life, 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.

Course Objectives: The primary objective of the course is to deepen students ability to apply mathematical thinking to problems involving geometry, applied algebra, and basic concepts of trigonometry, statistics, and probability. The objectives are directly related to the following criteria which are also the foundation of all assessments:

A Knowledge and understanding

Knowledge and understanding are fundamental to studying mathematics and form the base from which to explore concepts and develop problem-solving skills. Through knowledge and understanding, students develop mathematical reasoning to make deductions and solve problems.

At the end of the course, students should be able to:

- know and demonstrate understanding of the concepts from the five branches of mathematics (number, algebra, geometry and trigonometry, statistics and probability, and discrete mathematics)
- use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations, including those in real-life contexts
- select and apply general rules correctly to make deductions and solve problems, including those in real-life contexts.

B Investigating patterns

Investigating patterns allows students to experience the excitement and satisfaction of mathematical discovery. Working through investigations encourages students to become risk-takers, inquirers and critical thinkers. The ability to inquire is invaluable in the MYP and contributes to lifelong learning. Through the use of mathematical investigations, students are given the opportunity to apply mathematical knowledge and problem-solving techniques to investigate a problem, generate and/or analyse information, find relationships and patterns, describe these mathematically as general rules, and justify or prove them.

At the end of the course, students should be able to:
• select and apply appropriate inquiry and mathematical problem-solving techniques
• recognize patterns
• describe patterns as relationships or general rules
• draw conclusions consistent with findings
• justify or prove mathematical relationships and general rules.

C Communication in mathematics
Mathematics provides a powerful and universal language. Students are expected to use mathematical language appropriately when communicating mathematical ideas, reasoning and findings—both orally and in writing.

At the end of the course, students should be able to communicate mathematical ideas, reasoning and findings by being able to:
• use appropriate mathematical language in both oral and written explanations
• use different forms of mathematical representation
• communicate a complete and coherent mathematical line of reasoning using different forms of representation when investigating problems.

Students are encouraged to choose and use information and communication technology (ICT) tools as appropriate and, where available, to enhance communication of their mathematical ideas. Some of the possible ICT tools used in mathematics include spreadsheets, graph plotter software, dynamic geometry software, computer algebra systems, mathematics content-specific software, graphic display calculators (GDC), word processing, desktop publishing, graphic organizers and screenshots.

D Reflection in mathematics
MYP mathematics encourages students to reflect upon their findings and problem-solving processes. Students are encouraged to examine different problem-solving strategies and share their thinking with teachers and peers. Critical reflection in mathematics helps students gain insight into their strengths and weaknesses as learners and to appreciate the value of errors as powerful motivators to enhance learning and understanding.

At the end of the course, students should be able to:
• explain whether their results make sense in the context of the problem
• explain the importance of their findings in connection to real life where appropriate
• justify the degree of accuracy of their results where appropriate
• suggest improvements to the method when necessary

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 according to the criteria outlined above. In addition, students will take several “Gateway Skills Exams” that they must pass to receive credit for the course. These exams cover basic skills (not problem solving) that require proficiency to move ahead in mathematics. They can retake the exam if necessary.

Texts & Resources: We will use several texts, primarily the MYP. Other materials will be used as needed.
- 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 Middle Years Program Mathematics Guide includes a detailed outline of the content that students study over the 5 years of the MYP program. You can download this guide at http://www.aleigonzalez.org/Desert/MYPMathGuideSep11.pdf

A summary of the areas of study that are anticipated for this course is given below:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 Algebra review – operations with variables, fractions, factoring, exponents, radicals</td>
<td>14</td>
</tr>
<tr>
<td>Unit 2 Lengths, areas, volume, capacity</td>
<td>10</td>
</tr>
<tr>
<td>Unit 3 Lines, Angles, and Constructions</td>
<td>10</td>
</tr>
</tbody>
</table>
Investigations: Throughout the year various investigations will be assigned. These assignments will involve exploration about a mathematical idea and a written report communicating and reflecting on the student’s findings. These mandatory assignments are a critical part of the curriculum.

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 than 10 days overdue; in such cases, the assignment may be given an ‘F.’

Grading Policy: At the end of each semester a composite MYP score from 0 to 7 will be assigned based on the student’s standing in the various MYP Assessment Criteria. A Desert letter grade will then be assigned according to the following mapping:

- 7 = A
- 6 = A-
- 5 = B+
- 4 = B
- 3 = C-
- 2 = D
- 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 and assessed for correctness. 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
- As this class will involve a good deal of geometry, you will need a good quality ($10ish) compass and a straightedge. The compasses at school are generally inadequate for our purposes.
- 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.

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.