

8TH GRADE MATHEMATICS SYLLABUS

2021-2022

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Prerequisites, if applicable	Four basic operations (concepts and computability) applied to the set of the natural numbers Basic concepts of plane figures and polygons		
Relation with TOK (DP subjects)	N/A		

Course Description

Throughout this course, we will explore the four stands of MYP mathematics (Number, Algebra, Geometry and Trigonometry, and Statistics and Probability) divided into the six classifications of AERO standards: number and quantity, algebra, functions, modeling, geometry, and statistics and probability. Namely, we will:

- extend the knowledge of exponents to rational exponents,
- explore equations and inequalities in one variable and equations in two variables,
- understand and use a variety of functions (linear, quadratic, exponential, absolute value, piecewise, square root and cube root),
- learn about systems of linear equations,
- understand the concept of polynomials and factorize them,
- and analyze data through descriptive statistics and data displays.

MYP or DP Subject Aims

The aims of 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.

MYP or DP Subject Assessment Objectives

The objectives of any MYP subject group state the specific targets that are set for learning in the subject. They define what the student will be able to accomplish as a result of studying the subject. The objectives of MYP mathematics encompass the factual, conceptual, procedural and metacognitive dimensions of knowledge. Each objective is elaborated by a number of strands; a strand is an aspect or indicator of the learning expectation.

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- A. **Knowing and understanding.** Knowledge and understanding are fundamental to studying mathematics and form the base from which to explore concepts and develop skills. This objective assesses the extent to which students can select and apply mathematics to solve problems in both familiar and unfamiliar situations in a variety of 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.
- C. **Communicating.** Mathematics provides a powerful and universal language. Students are expected to use appropriate mathematical language and different forms of representation when communicating mathematical ideas, reasoning and findings, both orally and in writing.
In order to reach the aims of mathematics, students should be able to:
- D. **Applying mathematics in real-life contexts.** MYP mathematics encourages students to see mathematics as a tool for solving problems in an authentic real-life context. Students are expected to transfer theoretical mathematical knowledge into real-world situations and apply appropriate problem-solving strategies, draw valid conclusions and reflect upon their results.

Measurable Learning Outcomes

At the end of grade 8, students should be able to:

- A. Knowing and understanding
 - i. select appropriate mathematics when solving problems in both familiar and unfamiliar situations
 - ii. apply the selected mathematics successfully when solving problems
 - iii. solve problems correctly in a variety of contexts
- B. Investigation of patterns
 - i. select and apply mathematical problem-solving techniques to discover complex patterns
 - ii. describe patterns as relationships and/or general rules consistent with findings
 - iii. verify and justify relationships and/or general rules.

C. Communicating

- i. use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations
- ii. use appropriate forms of mathematical representation to present information
- iii. move between different forms of mathematical representation
- iv. communicate complete and coherent mathematical lines of reasoning
- v. organize information using a logical structure.

D. Applying mathematics in real-life contexts

- i. identify relevant elements of authentic real-life situations
- ii. select appropriate mathematical strategies when solving authentic real-life situations
- iii. apply the selected mathematical strategies successfully to reach a solution
- iv. explain the degree of accuracy of a solution
- v. explain whether a solution makes sense in the context of the authentic real-life situation.

Course Evaluation

Ministry of Education Rubric	Assessment Category	Percentage Weight in Grading Period
Formative 1	Class Work	20%
Formative 2	Assignments	20%
Formative 3	Projects	30%
Formative 4	Quizzes	15%
Summative Assessment	Tests	15%

Grade Scale Distribution (IB Grade versus local grade)

In order to guarantee that the national education system will recognize the grades obtained by students during their MYP studies, teachers in the different subject groups use conversion tables to convert MYP scores to the Ecuadorian Ministry of Education grading system.

This is the conversion table that the MYP subjects use:

MYP	Ministry of Education
8	10
7	9
6	8.5
5	8
4	7
3	6
2	5

1	4
0	0

Major Projects including links to Service Learning and Interdisciplinary projects.

(To be selected later in the year)

Units of Instruction

1st Semester	2nd Semester
1st Partial Unit 1A: Numbers and Expressions - Relationships between quantities - Exponents and real numbers - Expressions Unit 1B: Equations and Functions - Equations and inequalities in one variable - Equations in two variables and functions 2nd Partial Unit 2A: Linear Relationships - Linear functions - Building linear functions - Modeling with linear functions Unit 2A: Linear Relationships - Systems of equations and inequalities Unit 2B: Linear Relationships - Exponential functions and equations - Modeling with exponential functions	1st Partial Unit 3: Statistics and Data - Descriptive statistics - Data displays Unit 4: Polynomial Expressions and Equations - Polynomials and operators - Factoring polynomials 2nd Partial Unit 4: Polynomial Expressions and Equations - Factoring polynomials - Solving quadratic equations Unit 5: Functions and Modeling - Quadratic functions Unit 5: Functions and Modeling - Piecewise and absolute value functions - Square root and cube root functions