

Stockton Collegiate International Schools
MYP Mathematics: Algebra 2
Level 5, Grade 10

I. Course Description

Mathematics is a universal language that is a central foundation for the pure sciences, engineering, technology, and social sciences. Inherently included in the study of mathematics is a development of analytical reasoning and problem-solving skills that are vital to logical, abstract, and critical thinking. These skills are very important for all students, in and outside of school, as they pertain greatly to real world problems and decision-making in everyday life.

This course will introduce and expand upon previously learned mathematical concepts in a comprehensible and clear manner. Students will be encouraged to use appropriate strategies and mathematical terms to interpret and solve various problems through critical and creative thinking. Students will also have the chance to appreciate the usefulness of mathematics as they solve realistic problems that could be applied to the outside world.

Each of the MYP fundamental concepts will be directly incorporated into the daily activities of this course. Communication, holistic learning, and international cultural awareness will be a big part of each lesson. Also embedded in this course are each of the characteristics of the IB learner profile. Students will be encouraged to be inquirers, knowledgeable, thinkers, communicators, principled, open-minded, caring, risk-takers, balanced, and reflective.

II. State Standards and MYP Objectives

The aim of teaching this course is to allow students to: recognize that mathematics is all around us, appreciate the usefulness of mathematics, develop a mathematical curiosity, be able to communicate with mathematical terminology, and develop knowledge of the content.

MYP Objectives	California State Standards
<i>Knowledge and understanding:</i> Students know and demonstrate understanding of the concepts.	5.0 – Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically. In particular, they can plot complex numbers as points in the plane.
<i>Investigating patterns:</i> Students draw conclusions consistent with findings.	25.0 - Students use properties from number systems to justify steps in combining and simplifying functions.
<i>Communication in mathematics:</i> Students use mathematical language in written explanations.	16.0 - Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it.
<i>Reflection in mathematics:</i> Students explain why their results make sense.	11.2 - Students judge the validity of an argument according to whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.

III. Areas of Interaction

The areas of interaction will broaden the academic experiences for all students as they will have the ability to exercise their critical thinking and communication skills. Students will experience multiple approaches to learning as they will work in various ways, including individual and group activities. Group activities will encourage students to communicate their ideas to their peers while maintaining a focus on their own individual learning. Students will connect the content to real-world applications, including ways to help and serve the community. Students will investigate health and social education, developing an ability to interact with others in a way that is cohesive for all. They will understand our role in the environment and how we can use what we have learned to improve our surroundings. Finally, students will develop an appreciation for the mathematics behind human ingenuity and analyze why these ideas were created and how they have helped our advancement.

IV. Texts and Resources

Students will be required to bring a spiral notebook to class everyday to take notes. They will come to class prepared with pencils and paper. They will also need their Algebra I textbook.

University of Chicago School Mathematics Project: Advanced Algebra: Chicago, IL: McGraw Hill, 2008

V. Methodology

Various teaching strategies will be used in the classroom with a focus on student learning. Questions will always be encouraged as they are important in academics in general, but especially in mathematics. Students will learn the content through different kinds of interaction, including a heavy emphasis on group work as well as direct instruction. Doing so will help transition the class from activity to activity while giving students the opportunity to communicate and share their ideas with their peers. Students will have projects that will allow them to explore mathematical concepts in greater detail. There will be an emphasis on students showing all their work and earning partial credit if they can demonstrate that they understand the content.

VI. Methods of Assessment

The single most important aim of assessment at Stockton Collegiate is to support and encourage student learning. Teachers will use formative assessments to guide their instruction day-by-day. These assessments are generally not included in the students' final grades. Summative assessments are the students' opportunity to demonstrate their level of achievement at the end of a unit and are included as part of a final grade. The MYP approach to assessment recognizes the importance of the processes of learning as well as the products of learning. The MYP assessment model is criterion-related, meaning that it is based upon pre-determined criteria to which all students (and parents) have access.

Criteria A – Knowledge and Understanding

Criteria B – Investigating Patterns

Criteria C – Communication in Mathematics

Criteria D – Reflection in Mathematics

Name of Unit	Unit Question	Assessment
Functions That Function	What are the uses of function notation?	Unit Test
Variation	What are the differences between direct and inverse variation?	Real World Problem
Your mama's ex-boyfriend	How do you graph a line?	Real World Problem
The Matrix has you	What are the benefits of using matrices?	Unit Test
Systems	How do matrices relate to systems?	Unit Test
Emily!	How do imaginary numbers operate?	Unit Test
Xponential Chaos	What does exponential mean?	Unit Test
Inverses	What does inverse mean in mathematics?	Unit Test
It's Log, Log, Log!	How can logarithms be used in my future financial planning?	Real World Problem
Getting' Triggly With It	How did ancient mathematicians use triangles?	Unit Test
Polynomials	What is the benefit of factoring polynomials?	Unit Test
Conic Sections	How were conic sections derived?	Unit Test
Series	How are probabilities calculated?	Real World Problem

VII. Grading Policy

Grades will be determined using a combination of MYP marks and more traditional assessments. These grades will be combined to produce a composite mark of A, B, C, D, or F at the end of each semester according to traditional percentage guidelines (90-100: A; 80-89: B; 70-79: C; 60-69: D). Heavy emphasis will be given to a student's level of competency at the end of the grading period.