

Stockton Collegiate International Schools
MYP Mathematics: Geometry
Level 4, Grade 9

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 mathematical reasoning and problem-solving skills that are necessary for calculations and decision-making skills. These skills are very important for all students, in and outside of school, as they pertain greatly to real world problems in everyday life.

This course will introduce and expand upon previously learned mathematical concepts in a comprehensible and clear manner. Students will develop a stronger grasp of fundamental math concepts as they form a foundation that will be needed for Algebra and Geometry. 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 the attributes 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

MYP Objectives	California State Standards
Knowledge and understanding: Students know and demonstrate of the concepts.	5.0 Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.
Investigating patterns: Students draw conclusions consistent with findings.	2.0 Students write geometric proofs, including proofs by contradiction. 3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.
Communication in mathematics: Students use mathematical language in written explanations	1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.
Reflection in mathematics: Students explain why their results make sense.	8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

III. Areas of Interaction

The areas of interaction will broaden the academic experience 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 are expected to come to class prepared and ready to learn. They will be required to bring composition notebook, a calculator, and writing utensils to every class. They will also need a geometry set and their Geometry textbook:

University of Chicago School Mathematics Project: Geometry: Chicago, IL: McGraw Hill, 2008.

V. Methodology

Teaching strategies in the classroom will 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. Student projects will allow exploration of 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
Chapter 1 Points and Lines	Be able to understand the Euclidean conception of a point as a location with no length, breadth, or depth.	Unit Test
Chapter 2 The Language and Logic of Geometry	To understand the language and logic of geometry.	
Chapter 3 Angles and Lines	Be able to identify the different measures between 0 to 360. Understand how proofs are constructed and the importance of parallel and perpendicular lines.	Real World Problem
Chapter 4 Congruence Transformation	Understand the importance of transformation.	
Chapter 5 Proofs Using Congruence	Using previous ideas to complete proofs and the logic of proofs.	
Chapter 6 Polygons and Symmetry	Nature has different forms of shapes and sizes.	Real World Problem
Chapter 7 Applications of Congruent Triangles	Using theorems to prove congruent triangle.	Unit Test
Chapter 8 Lengths and Areas	The Pythagorean Theorem	Unit Test
Chapter 9 Three-Dimensional Figures	If you look around you what do you see?	Real World Problem

Chapter 10 Formulas for Volume	Every object has volume.	Unit Test
Chapter 11 Indirect Proofs and Coordinate Proofs	Using previous ideas to complete proofs and the logic of proofs.	Unit Test
Chapter 12 Similarity	Many objects look similar. How do we determine that they are similar?	Unit Test
Chapter 13 Similar Triangles and Trigonometry	Similarity? Where does it lead us to.	Unit Test
Chapter 14 Further Work with Circles	Circles lets investigate them.	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.