SAINT GEORGE SCHOOL
FOUNDED 1965

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GEOMETRY
Grade Level: 4th From (10th Grade)
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INTRODUCTION

Geometry is a rigorous course of math that focuses on the practical aspect of the subject, with emphasis on acquiring an intuitive understanding of mathematical topics. This objective is carried out through comparing and contrasting the language of Math with our daily language, so as to find the advantages and disadvantages of using one over the other, allowing studentsto develop an appreciation for what math is able to do.

SKILLS

- Familiarize the students with the major concepts of Euclidean Geometry, and introduce them to analytical thinking through the correct use of inductive and deductive reasoning
- Acquire an understanding of what polygons are, and identify and use the properties that apply to the different kinds of polygons.
- Become familiar with parallel lines, the angles that form when a transversal is present, and the special relationships that exist among these angles. Also, students will utilize the famous parallel postulate to prove relationships of triangles.
- The course also covers a brief introduction to Trigonometry, which includes the definitions of Hypotenuse, Opposite Side, Adjacent Side, Sine, Cosine, Tangent, and the Pythagorean theorem and its converse. Also, for better understanding the definition of a derivative, in a subsequent Calculus class, a section has been included for explaining what Secant and Tangent lines are.
- Introduce the concepts of Perimeter, Area, Diameter, Circles, Radius, Circumference, and the irrational number called Pie π. Also, the course will cover how to represent points, lines, planes, and angles in three-dimensional space.
- Moreover, students will also be exposed to the importance of Surface Area and Volume of three-dimensional shapes, such as: Prisms, Pyramids, Cones, Cylinders and Spheres.
- Identify who the main characters are in the history of Geometry, people like: Archimedes, Euclid, Euler, Pythagoras, and Descartes
- Develop independent thinking and realize how they can use their skills to conduct formal research

- Become aware of career choices in math: Actuarial Science, Statistics, Research, Engineering, etc.
- If time allows, they will utilize the laws of sine and cosine, to be able to work with real-life applications that do not involve right triangles.

CONTENT

Exploring Geometry

- Points, Lines, Planes, and Space
- Rays, Segments, Angles, etc.
- Segments addition postulates
- Congruency of triangles
- Rigid transformation: translation, rotation, and reflection

Reasoning in Geometry

- Define conditional statements and model them using Euler or Venn diagrams
- Form the converses of conditionals
- Use Euler diagrams to study and identify proper definitions
- Develop Theorems from Conjectures

Parallel Lines and Polygons

- Define Polygon
- Define and apply the term symmetry
- Identify the properties of quadrilaterals and the relationships among these properties
- Define: Transversal, Alternate Interior Angles, Alternate Exterior Angles, Same Side Interior Angles, and Corresponding Angles
- Identify and apply the Euclid's Parallel Postulate and prove the Triangle Sum Theorem
- Define Mid-Segment of a Triangle and Mid-Segment of a Trapezoid

Triangle Congruence

- Define congruent polygons
- SSS, SAS, and ASA postulates
- Use congruence of triangle for congruence of corresponding parts
- Trigonometric functions
- Sine and cosine rules

Perimeter & Area

- Rectangle sum areas postulates
- Circumferences & areas of circles

- Secant and Tangent lines
- Pythagorean Theorem & Converse
- Lasts Theorem of Pierre de Fermat

Shapes in Space

- Define polyhedron
- Identify Points, lines, segments, planes, angles in space
- Define prisms (right & oblique)
- Graphing in 3-Dimensions
- Equation of lines & planes in 3-D

Surface Area & Volume

- Surface area & volume of Right Prisms
- Surface area & volume of
  Regular Pyramids
- Surface area & volume of Cylinders and Cones
- Surface area & volume of Spheres
- IF POSSIBLE: THE LAWS OF SIGN & COSINE

Properties of Logarithms

- Rules of Exponents
- Rules of Logarithms

TEXTBOOKS AND OTHER RESOURCES

- Text Book: Geometry, by: Holt, Rinehart and Winston
- http://www.classzone.com/cz/books/geometry_2011_na/book_home.htm?state=INTER
- Geometry, Cliffs Study Solver, by: Cliffs notes
- Standard Deviants DVD: Geometry 1 & 2
- Quick-Study Outlines: Geometry 1 & 2
- Quick-Study Outlines: Trigonometry
- Smart Board Taught Lessons
- Teacher Prepared Summaries and Posters

TEACHING STRATEGIES

Students will benefit from a wide range of teaching strategies and evaluation criteria.

1. Students will be exposed to the style of the book, which includes formal definitions, problem solving techniques, activities and exercises.
2. In addition to the above, in layman's terms, prepared by the teacher, they get an intuitive interpretation of the topic, including a summary of the lesson and some selected exercises to be discussed during class.
3. Occasionally, a math video may be brought in to further reinforce what is being taught.
4. Students will also be encourage to explain, in their or words, their interpretation of the given topic of discussion and to think of situations from everyday life where the particular mathematical techniques could be useful.
5. The student will be administered two (2) different tests (worth 15 and 25% percent of the total grade) per Corte to evaluate their progress and understanding of mathematical techniques.
6. If students need further help, they could come see the teacher, one-on-one, during hours of enrichment, every Thursday, from 2:45 to 3:30, at Octavio Paz.

Furthermore, students will be required to keep a one-word-a-day English vocabulary enrichment list – preferably in the back of their notebooks. There are several strategic reasons why they should keep this collection of words. First, they will be able to better understand textbooks and teachers as a result of knowing the exact meaning of the words being used. Second, this activity does improve their written and spoken English. Third, as a result of studying the most sophisticated vocabulary of the English language, they will be preparing for their SAT. And, finally, it's my observation that this gives them an opportunity to learn something other than math, and, for the most part, it makes the class a lot more interesting and refreshes the minds of the students.

List of class activities:

- Present the Text Book perspective of the topic
- http://www.classzone.com/cz/books/geometry_2011_na/book_home.htm?state=INTER
- Prepare lesson summaries to maximize in-class time
- Complete class assignments and homework for the given chapters
- Triangle & the Binomial Theorem
- Explore the essential questions of the class period as a group
- Mathematical debates
- Video aided instructions
- History of math
- Biographies of mathematicians
- Famous mathematical quotes
- Major breakthroughs in Math
- Modern issues in Math

- The new frontiers of present day Math
- Further Readings and authors of mathematical literature
- Present final-exam review
- Present mid-term review

EVALUATIONS

Grading Criteria

- In-class Assignments: 30%
- Homework and Projects: 15%
- Test #1: 20%
- Test #2: 25%
- Cooperation: 10%

OTHER REMARKS REGARDING OUR CLASS

Students achieving grade levels of 96% or above, whose conduct are over 90, in all Grading Periods, will be exonerated from taking the final exam.