MATHEMATICS

There is no such thing as a "math person." Anyone can learn mathematics to high levels.   Mathematics is a universal language. Our mathematics department seeks to balance experiences with procedural skills (the how), conceptual knowledge (the why), and application/problem solving (the when/where).

The Middle Years Programme (MYP) mathematics courses are designed to address the Common Core State Standards Mathematics (CCSSM). These courses will focus on content that includes: Ratios and Proportional Relationships, the Number System, Expressions and Equations, Functions, Geometry, as well as Statistics and Probability. The coursework enables students to appreciate mathematics as a visual and engaging subject by developing an understanding of mathematical principles, developing logical, critical and creative thinking skills, and applying these skills to real-life situations. Students often work collaboratively to problem solve and develop the confidence to become independent thinkers.

COURSE STRUCTURE

Collaborative Learning: Working in teams allows for deeper learning of mathematics and the practice of important social skills as a prelude to becoming an effective team member in the workplace.

Problem-Based Learning: Students work together to solve real-world problems, explaining their reasoning and choices of methods, and using logic to connect ideas. Teacher serves as facilitator.

Mixed, Spaced Practice: Spacing out review sessions over time increases long-term retention of knowledge. Students are presented with different kinds of problems during a single review or homework practice.

THE EIGHT STANDARDS FOR MATHEMATICAL PRACTICE (SMP) GRADES K-12

"The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years."
—*Common Core State Standards for Mathematics*, page eight

1. **Make sense of problems and persevere in solving them**

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics

5. Use appropriate tools strategically

6. **Attend to precision**

7. Look for and make use of structure

8. Look for and express regularity in repeated reasoning

GRADE 6 (MYP YEAR 1) • COMMON CORE STATE STANDARDS IN MATHEMATICS (CCSSM)

- **Ratios and Proportional Relationships**
  - Understand ratio concepts and use ratio reasoning to solve problems.
- **The Number System**
  - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
  - Multiply and divide multi-digit numbers and find common factors and multiples.
  - Apply and extend previous understandings of numbers to the system of rational numbers.
- **Expressions and Equations**
  - Apply and extend previous understandings of arithmetic to algebraic expressions.
  - Reason about and solve one-variable equations and inequalities.
  - Represent and analyze quantitative relationships between dependent and independent variables.
- **Geometry**
  - Solve real-world and mathematical problems involving area, surface area, and volume.
- **Statistics and Probability**
  - Develop understanding of statistical variability.
  - Summarize and describe distributions.

GRADE 7 (MYP YEAR 2) • COMMON CORE STATE STANDARDS IN MATHEMATICS (CCSSM)

- **Ratios and Proportional Relationships**
  - Analyze proportional relationships.
  - Solve real-world and mathematical problems.
- **The Number System**
  - Apply and extend previous knowledge.
  - Add, subtract, multiply, and divide rational numbers.
- **Expressions and Equations**
  - Use properties of operations to generate equivalent expressions.
  - Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- **Geometry**
  - Draw, construct, and describe geometrical figures and describe the relationships between them.
  - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
- **Statistics and Probability**
  - Use random sampling to draw inferences about two populations.
  - Draw informal comparative inferences about two populations.
  - Investigate chance processes and develop, use, and evaluate probability models.

GRADE 8 (MYP YEAR 3) • COMMON CORE STATE STANDARDS IN MATHEMATICS (CCSSM)

In 8th grade, students will focus on the three areas that will encourage them to become a successful mathematician: Cooperative Learning, Problem-Based Learning, and Mixed, Spaced Practice.

Throughout the 8th grade year, students will focus on the following Mathematics Standards:

1. **Equations**
   - Simplifying Expressions with Variables
   - Graphs and Equations

- Multiple Representations of Equations
- Systems of Equations

2. **<u>Geometry</u>**
   - Transformations and Similarities
   - Angles and the Pythagorean Theorem

3. **<u>Functions</u>**
   - Exponents and Functions

4. **<u>Probability and Statistics</u>**
   - Slopes and and their associations