

Course Curriculum: Grade 6 Math – IB Program

Welcome to the Grade 6 Mathematics Curriculum at IW Academy, where students embark on a journey to explore and understand the dynamic world of mathematics. Aligned with the International Baccalaureate (IB) Middle Years Programme (MYP), this course is designed to foster intellectual curiosity, critical thinking, and a deep appreciation for the power of mathematics. Through inquiry-based learning and a student-centered approach, we aim to equip students with the skills and knowledge they need to succeed in higher mathematical challenges and real-world applications.

Engaging and Comprehensive Curriculum

The Grade 6 Mathematics curriculum is carefully crafted to provide a holistic and engaging learning experience. It emphasizes the IB philosophy of inquiry-based learning, encouraging students to ask questions, explore mathematical concepts, and develop a deep understanding through hands-on activities and collaborative projects. Our student-centered approach ensures that each learner is supported in their individual mathematical journey, building confidence and fostering a lifelong love for mathematics.

Key Learning Objectives

1. Numbers and Operations:

- Students will delve into the world of numbers, mastering key concepts such as fractions, decimals, integers, and their operations. They will explore the relationships between these numbers and develop a solid understanding of arithmetic operations, including addition, subtraction, multiplication, and division.
- The curriculum encourages students to apply these skills in real-world contexts, enhancing their ability to make connections between abstract mathematical concepts and practical applications.

2. Algebraic Thinking:

- Algebra is introduced in this Curriculum as a fundamental tool for understanding patterns and relationships in mathematics. Students will learn about variables, expressions, and simple equations, developing their ability to manipulate algebraic expressions and solve basic equations.
- Inquiry-based projects will allow students to explore algebraic concepts in depth, fostering critical thinking and problem-solving skills that are essential for success in more advanced mathematical studies.

3. Geometry and Spatial Reasoning:

- The course will explore foundational concepts in geometry, including the properties of shapes, angles, symmetry, and the measurement of area, perimeter, and volume. Students will develop their spatial reasoning skills, which are critical for understanding the physical world around them.
- Students will engage in hands-on activities, such as constructing geometric shapes and models, to deepen their understanding of geometric principles and their applications in real-world contexts.

4. Data Handling and Probability:

- Students will learn to collect, analyze, and interpret data using measures of central tendency (mean, median, mode) and graphical representations such as bar graphs, line plots, and pie charts. They will also be introduced to basic concepts of probability and statistical reasoning.
- Through inquiry-based projects, students will explore how data can be used to make informed decisions, developing skills that are increasingly important in our data-driven world.

5. Ratio, Proportion, and Percentages:

- Understanding ratios, proportions, and percentages is essential for solving real-world mathematical problems. Students will learn to use these concepts to compare quantities, scale figures, and solve problems related to everyday situations.
- The curriculum emphasizes the application of these concepts in various contexts, such as financial literacy, cooking, and engineering, making learning relevant and engaging for students.

6. Mathematical Reasoning and Problem Solving:

- Critical thinking and problem-solving are at the heart of the IB MYP approach to mathematics. Students will be encouraged to approach mathematical challenges with an open mind, using logical reasoning and creativity to find solutions.
- The Curriculum will include a variety of problem-solving activities, from puzzles and games to real-world scenarios, helping students develop a flexible and adaptable approach to mathematics.

Inquiry-Based Learning and Research

Inquiry-based learning is a cornerstone of the IB philosophy, and this Curriculum is no exception. Students will be encouraged to explore mathematical concepts through guided inquiries, research projects, and independent investigations. They will learn to formulate research questions, gather and evaluate mathematical data, and present their findings in clear and well-organized formats. This approach not only deepens students' understanding of mathematical concepts but also prepares them for the rigorous research demands of the IB MYP and beyond.

Life Skills Integration

In addition to academic skills, the Grade 6 Mathematics Curriculum also focuses on the development of essential life skills. These skills are integrated into the curriculum to ensure that students are not only mathematically proficient but also well-rounded individuals capable of thriving in diverse environments.

1. Analytical Thinking and Problem Solving:

- Students will develop the ability to think analytically, break down complex problems, and approach challenges with confidence. These skills are essential for success in mathematics and beyond.

2. Collaboration and Communication:

- Group projects and collaborative activities will help students develop strong teamwork and communication skills, enabling them to work effectively with others and articulate their ideas clearly.

3. Time Management and Organization:

- Through the planning and execution of research projects, problem-solving tasks, and assessments, students will enhance their time management and organizational skills, learning to prioritize tasks and meet deadlines.

4. Digital Literacy and Ethical Use of Information:

- As students engage with digital tools and online resources, they will develop digital literacy skills, including the responsible and ethical use of information, ensuring they are prepared for the demands of the digital age.

Innovative Teaching Methods and Assessments

Our Grade 6 Mathematics Curriculum employs a variety of innovative teaching methods and assessment strategies to create a dynamic and supportive learning environment:

- **Inquiry-Based Learning:** Students are encouraged to ask questions, explore concepts in depth, and connect their learning to real-world situations, fostering a deeper understanding and appreciation for mathematics.
- **Collaborative Learning:** Group activities and projects promote teamwork and communication, allowing students to learn from one another and develop collaborative problem-solving skills.
- **E-Learning and Digital Tools:** Interactive platforms, digital resources, and online discussions make learning engaging and accessible, allowing students to practice and apply their skills in various contexts.
- **Formative and Summative Assessments:** Regular assessments, including quizzes, problem sets, projects, and presentations, provide ongoing opportunities for students to demonstrate their understanding and receive tailored feedback.
- **Reflective Practices:** Students are encouraged to reflect on their learning, set personal goals, and develop self-awareness, aligning with the IB MYP's focus on developing independent and reflective learners.

Learning Outcomes

By the end of the Grade 6 Mathematics course, students will have:

- Developed a strong foundation in numbers, algebra, geometry, data handling, and ratio and proportion, preparing them for more advanced mathematical studies.
- Gained confidence in their ability to solve mathematical problems, using logical reasoning and creative thinking.
- Enhanced their understanding of mathematical concepts and their applications in real-world contexts, aligning with the IB's emphasis on global awareness and interconnectedness.
- Cultivated essential life skills, including analytical thinking, collaboration, communication, and digital literacy, preparing them for success in both academic and personal endeavors.

This course is designed to be both challenging and rewarding, providing students with the tools and confidence they need to excel in their future academic pursuits. Let's embark on this exciting mathematical journey together and make learning mathematics a joyful and enriching experience!

The table below clarifies the Curriculum content, the chapters and the main skills in each chapter:

#	Chapter	Skills
1	Chapter One: Numbers and Operations - Integers	• Adding integers, • subtracting integers, • addition properties for integers, • multiplying & dividing integers,

		• breaking down numbers into prime factors and using exponents to express numbers, • the perfect square and the square root, cubed numbers and the cubed root
2	Chapter Two: Numbers and Operations - Fractions & Decimals	• Reading & writing decimals (to the thousandth place), • Comparing decimals and arranging them in increasing and decreasing orders, • Converting between decimals and fractions and percentages, • Comparing fractions, • Multiplying & dividing decimals, • Multiplying & dividing fractions, • Estimating decimal products and quotients, • Multiplying fractions and decimals, • Dividing fractions and decimals
3	Chapter Three: Algebraic Thinking	• The coordinate plane-identifying a point on the coordinate plane-representing a point on the coordinate plane, • Variables and algebraic expressions • Calculating the numerical value of an algebraic expression with one variable, • Identifying the relationship between points on a graph, • Equivalent equations and their properties, • Converting written expressions into algebraic expressions • Converting algebraic expressions into written expressions
4	Chapter Four: Geometry and Spatial Reasoning	• Exploring the relationship between quadrilaterals, • Examining the sums of triangle angles, • Examining the sums of quadrilateral angles, • Examining the sums of angles around a point, • Drawing a triangle if the side lengths are known (two sides and the angle in between-two angles and the side connecting them), • Drawing a parallelogram with known side lengths (two sides and an angle- two sides and a diagonal), • Symmetry, • Using net diagrams to build figures
5	Chapter Five: Measurements	• Perimeter of a polygon, • Area of a parallelogram, • Area of a trapezoid, • Volume of a rectangular prism, • Area of a surface of a rectangular prism, • Estimating angles • Checking the estimation using a protractor, • Estimating the area of irregular polygons,

		• Units for measuring volume
6	Chapter Six: Data Handling, Probability & Statistics	• Data collection • Organizing and representing data in a frequency table, • The histogram • Representing data in a histogram • Gathering information from a histogram, • Representing data in a line graph, pie charts • Representing data in a pie chart
7	Chapter 7: Algebraic Thinking - Mathematical Reasoning and Problem Solving - Advanced Topics	Equations and Inequalities: • Solve percent problems using equations. • Define and identify solutions to inequalities. • Write and graph inequalities for real-world conditions. (Part 1) • Write and graph inequalities for real-world conditions. (Part 2) • Solve one-step inequalities.
8	Chapter 8: Geometry and Spatial Reasoning - Advanced Topics	• Draw polygons in the coordinate plane and find area and perimeter (Part 1). • Draw polygons in the coordinate plane and find area and perimeter (Part 2). • Solve real-world problems involving distance, area, and perimeter of polygons on and off the coordinate plane.
9	Chapter 9: Ratio, Proportion, and Percentages - Advanced Topics	• Represent ratios using double number lines and identify equivalent ratios. • Solve ratio problems using strategies including double number lines. • Compare situations using equivalent ratios and double number lines. • Use ratio reasoning to solve a three-act task. • Solve part: part ratio problems using tape diagrams. • Solve part: whole ratio problems using tape diagrams. • Solve more complex ratio problems using tape diagrams. • Solve ratio problems using a variety of strategies, including reasoning about diagrams, double number lines, tables, and tape diagrams. Summarize strategies for solving ratio problems.
10	Chapter 10: Geometry and Spatial Reason - Advanced Topics	• Describe and analyze the overall shape of dot plots and histograms, including symmetry, skewness, outliers, and clusters. • Use the range and interquartile range to understand the spread and variability of a data set. • Understand and determine mean absolute deviation (MAD) as a measure of variability of a data set. • Represent data using box plots.

		• Analyze box plots and other representations, and summarize numerical data in context.
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