

## **IB Middle Years Program - Math**

10th grade math, Willows Preparatory School

### **Course Description:**

#### **MYP Mathematics**

MYP mathematics courses help specifically to prepare students for the study of DP mathematics courses. As students progress from the MYP to the DP, the emphasis on understanding increases as students work towards developing a strong mathematical knowledge base that will allow them to study a wide range of topics. Through this process they also work on communicating their ideas in ways that allow others to understand their thinking. The MYP mathematics objectives and criteria have been developed with both the internal and external assessment requirements of the DP in mind. The use of technology, which is required in DP mathematics, is also emphasized in the MYP as a tool for learning, applying and communicating mathematics.

### **Student Learning Outcomes:**

The aims of MYP mathematics are to encourage and enable students to:

- Enjoy mathematics, develop curiosity and begin to appreciate its elegance and power.
- Develop an understanding of the principles and nature of mathematics.
- Communicate clearly and confidently in a variety of contexts.
- Develop logical, critical and creative thinking.
- Develop confidence, perseverance, and independence in mathematical thinking and problem-solving.
- Develop powers of generalization and abstraction.
- Apply and transfer skills to a wide range of real-life situations, other areas of knowledge and future developments.
- Appreciate how developments in technology and mathematics have influenced each other.
- Appreciate the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics.
- Appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives.
- Appreciate the contribution of mathematics to other areas of knowledge.
- Develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics.
- Develop the ability to reflect critically upon their own work and the work of others.

## **Course Schedule:**

### **Semester 1:**

#### **Unit 11: Measurement of spaces in different dimensions**

- Knowing the terms chord, arc, segment and sector.
- Finding the length of an arc of a circle
- Finding the angle in a sector of a circle
- Finding the perimeter and area of a sector of a circle
- Finding the length of a chord
- Finding the surface area of any 3D shape (including pyramids, cones and spheres)
- Finding the volume of any 3D shape (including pyramids, cones and spheres)
- Understanding and using coordinates in three dimensions
- Using the distance, section and midpoint formulae in three dimensions
- Using Pythagoras and trigonometry in three dimensions
- Finding the angle between a line and a plane

#### **Unit 12: Justifying circle theorems**

- Finding angles and lengths using circle theorems
- Proving results using circle theorems
- Examining 'If ... then ...' statements and testing the truth of their converses
- Using circle theorems to find lengths of chords
- Finding lengths using the intersecting chord theorem
- Identifying congruent triangles based on standard criteria
- Using congruent and similar triangles to prove other geometric results

### **Semester 2:**

#### **Unit 13: Making changes to rational expressions and equations**

- Changing the subject of a formula
- Simplifying rational algebraic expressions
- Performing mathematical operations on rational algebraic expressions
- Solving linear and quadratic rational equations algebraically and graphically
- Using equivalence transformations to solve rational equations

- Using rational equations to model situations and solve problems
- Graphing rational functions of the form  $f(x) = a(x - h) + k$
- Finding asymptotes of graphs of rational functions
- Transforming rational functions using translations, reflections and dilations
- Identifying transformations of graphs
- Finding the inverse of a rational function

#### **Unit 14: Logarithms explained**

- Evaluating logarithms with and without a calculator
- Writing an exponential statement as a logarithmic statement
- Solving exponential equations
- Writing and solving exponential equations from real-life situations
- Using natural logarithms
- Drawing graphs of logarithmic functions
- Finding the inverse of an exponential function
- Justifying algebraically and graphically that a logarithmic function and the corresponding exponential function are mutual inverses
- Identifying and applying function transformations on graphs of logarithmic functions
- Developing the laws of logarithms
- Using the laws of logarithms to simplify expressions and solve equations
- Proving the laws of logarithms
- Proving the change of base formula

#### **Unit 15: The unit circle and trigonometry**

- Drawing and using the unit circle to find sines, cosines and tangents of angles
- Converting angles between degrees and radians
- Using the radian formula for the length of an arc
- Solving problems involving angular and linear displacement
- Drawing graphs of  $\sin\theta$  and  $\cos\theta$ , where  $\theta$  is in radians
- Describing transformed trigonometric functions of the form  $f(x) = a \sin(bx - c) + d$
- Finding the area of a non-right-angled triangle
- Using the sine rule
- Using the cosine rule
- Finding the area of a segment of a circle

- Using the sine and cosine rules to solve problems involving bearings
- Using trigonometric identities to simplify expressions and solve equations
- Solving equations involving trigonometric functions

MYP Science Content Brief: [https://www.ibo.org/globalassets/digital-toolkit/brochures/myp-brief\\_mathematics\\_2015.pdf](https://www.ibo.org/globalassets/digital-toolkit/brochures/myp-brief_mathematics_2015.pdf)

## **Homework**

As a rule, students are going to have homework, since practice is important in math.

## **Assessment:**

For a detailed description of our Assessment Policies, please see our assessment Policy Handbook on our website.

Willows Preparatory School teachers create and implement both formative and summative assessments, both of which are related to each other and integral to the learning process.

Formative Assessment (20% of semester grade) – \_assessments that provide smaller amounts of feedback on specific learning objectives and/or require students to demonstrate their knowledge of specific targeted aims in order to drive future instruction (e.g. at WPS: lesson exit ticket, daily warm-ups, comprehension quizzes, etc.).

Summative Assessment (80% of semester grade)– \_assessments that are designed to provide evidence for evaluating student achievement using required MYP subject-group specific assessment criteria<sup>2</sup> (e.g. at WPS: written assessments, projects, presentation, performances, etc.).

## **Submission Guidelines**

\*Guidelines are subject to change. These are general course guidelines, and it should be noted that Mrs. Yepes may alter or add additional, more specific requirements to any formative or summative assignment throughout the year.

### Files

1. All work is submitted in Managebac.
2. Files cannot be JPG's.
3. Files must be named with name or initials and name of assignment/submission
  - a. Ex. JG\_unit3\_conceptmap.pdf

### Late Work

1. After unit 1, a deduction will occur depending on the type of late work:
  - a. 20% per school day for most formative homework, or
  - b. 10% per school day for project based work, or
  - c. one MYP level per school day for in-class summative assessments.

2. Students are encouraged to revise their work for credit.
3. Students will have until the end of the unit in which the work was assigned to re-submit revised work, or to submit late-work.
4. There is no late penalty for revisions.
5. STUDENTS MUST NOTIFY THE TEACHER VIA EMAIL when they have submitted late work or revised work.
  - a. Write 'LATE WORK' in the subject line.
  - b. Specify what assignment was submitted in the email. (Name or date)
  - c. Late Work emails, are a checklist for the teacher, do not expect any response.

### Tests/Quizzes

1. If you miss a quiz or test (unless it is a documented emergency and have a doctor's note or other documentation) you will NOT be able to make it up and will receive a 0.
2. If you know you will be missing school the day of a test or quiz, you may ask permission from me to take the test/quiz early.
3. NO MAKE-UP TESTS/QUIZZES ARE ALLOWED (unless it is a documented emergency and have a doctor's note, or other documentation).

### Missing Class

1. If a student is missing class, they should notify the teacher through email to ask for missing work.
2. It is students' responsibility to ask about and complete missed work.
3. Students should ask for help if there is uncertain about the concepts, or need assistance!

### **Student Conduct**

In order to maintain a safe and enjoyable time at school, students are expected to behave in a responsible manner. Violations of student conduct expectations may result in disciplinary measures, which are explained later in this document. The following are expectations of all WPS students:

- Demonstrate courteous and respectful behavior at all times, including with use of school equipment/property and other people's belongings
- Follow staff instructions promptly
- Arrive to class fully equipped, ready to engage and in a timely manner
- Keep up to date with academic submissions and timelines
- Discuss your academic needs with your classroom teachers
- Walk in shared spaces and speak at a respectful volume while others are working and learning
- Conduct themselves with a sense of decorum

- When applicable, follow all guidelines outlines in the COVID-19 Handbook.

### **Zero Tolerance Policies**

Willows Preparatory School has zero tolerance for alcohol, drugs, tobacco, weapons, age inappropriate material, graffiti and repeated instances of bullying behavior. If any students are found in possession of or engaging in any related activities of the above, whether on campus and/or during school hours, appropriate referrals will be made and consequences/outcomes will be documented on the student's file.

### **Consequences**

Any student misconduct will be documented and may result in the following:

- A referral to Head of School or Assistant Head of School
- Support services through Counselor referral
- Meeting with parent, teacher, and administration
- Probation from extracurricular activities or other privileges (i.e. sport, clubs, lunch outside)
- Restricted use of facilities

Misconduct issues of a more serious nature, such as those related to zero tolerance policies include:

- Suspension – You are expected to keep up with your schoolwork during this time, as no allowances will be made in this regard.
- Expulsion – You are permanently disenrolled from Willows Preparatory School

### **Technology**

Every student at WPS has their own Microsoft Surface. WPS's official Laptop/Technology Policy is found at the end of this document.

### **Teacher-Student E-mail Communication**

You have the opportunity to reach out to teachers and staff using email; however, when applicable, face-to-face communication is preferable. Student email addresses should only be used for communication about academic issues or to ask questions in a respectful and professional manner. Students are expected to check email on a daily basis. If a student receives an email or message from another student that is confusing or inappropriate, please notify a teacher or staff member immediately. Willows Preparatory School reserves the right to access all WPS student emails, reset all passwords, and if necessary, suspend all email activity.

### **Cell Phones and smart devices**

We understand that cell phones and other smart devices are an essential part of daily life. Smart watches while linked to cell phones are considered cell phones. Please make sure that the watches are on Do Not Disturb mode during the school day. Students are permitted to bring cell phones to school each day subject to the following conditions:

- Cell phones should remain OFF when students are present on the school campus. Cell phones must be stored in book bags during the 1<sup>st</sup> semester (or for however long COVID-19 Handbook guidelines are in place) or in student lockers.
- Students may use their cell phones to contact parents upon request. All authorized cell phone use must occur at the Front Desk in the main building and/or under the supervision of an administrator or teacher.

If a member of staff can see or hear a cell phone, the phone will be confiscated and turned over to the front desk. Confiscated phones will be returned at the end of that school day from the front desk after a parent is notified about the violation of this policy. All incidents are documented and recorded—repeat violations may result in additional consequences.

In case of a personal emergency on campus (illness, personal situation, etc.) the student's first line of contact is a staff member. In family emergency situations, parents should contact the front office if they need to reach a student.

#### Classroom Computer Use

Laptops will be used regularly in class for lessons, notes, and activities. Students should not be checking emails, grades, chatting via Teams, or any other activities on their computer unless the teacher has given them permission. If a student is found not using a computer appropriately, the computer will be taken away until the end of class and the following will take place:

- 1st Time: A warning from administration.
- 2nd Time: An email sent home to parents.
- 3rd Time: Meet with administration and discuss possible repercussions.

WPS Students will no longer be allowed to use headphones for personal use in any place of the school building unless a) the headphones are being used for specific class content (i.e. sound editing a video for a project); or b) they are being used before or after school hours (8:30am-3:30pm). Students should not have Spotify or any other streaming music program on their school computers.

Student Name (Print) \_\_\_\_\_

Student Signature \_\_\_\_\_ Date \_\_\_\_\_

Parent/Guardian Signature \_\_\_\_\_ Date \_\_\_\_\_

*Please return by September 10, 2021*

