

DP Biology – Year 1
11th grade Science, Willows Preparatory School

Course Description:

IB DP Science

Biology is the study of life. The first organisms appeared on the planet over 3 billion years ago and, through reproduction and natural selection, have given rise to the 8 million or so different species alive today. Estimates vary, but over the course of evolution 4 billion species could have been produced. Most of these flourished for a period of time and then became extinct as new, better adapted species took their place. There have been at least five periods when very large numbers of species became extinct and biologists are concerned that another mass extinction is under way, caused this time by human activity. Nonetheless, there are more species alive on Earth today than ever before. This diversity makes biology both an endless source of fascination and a considerable challenge.

With inquiry at the core, the IB DP sciences framework aims to guide students to independently and collaboratively investigate issues through research, observation and experimentation. The IB DP sciences curriculum must explore the connections between science and everyday life. As they investigate real examples of science applications, students will discover the tensions and dependencies between science and morality, ethics, culture, economics, politics, and the environment.

Scientific inquiry also fosters critical and creative thinking about research and design, as well as the identification of assumptions and alternative explanations. Students should learn to appreciate and respect the ideas of others, gain good ethical-reasoning skills and further develop their sense of responsibility as members of local and global communities.

Learning science involves more than simply learning technical terminology. The IB DP considers all teachers to be language teachers and, thus, MYP sciences should enable students to access, use and communicate scientific knowledge correctly and confidently in oral, written and visual modes.

Student Learning Outcomes:

The goals of IB DP Biology are to:

The Diploma Program aims to develop in students the knowledge, skills and attitudes they will need to fulfill the aims of the IB, as expressed in the organization’s mission statement and the learner profile. Teaching and learning in the Diploma Program represent the reality in daily practice of the organization’s educational philosophy.

The aims enable students, through the overarching theme of the Nature of science, to:

1. appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
2. acquire a body of knowledge, methods and techniques that characterize science and technology

3. apply and use a body of knowledge, methods and techniques that characterize science and technology
4. develop an ability to analyze, evaluate and synthesize scientific information
5. develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
6. develop experimental and investigative scientific skills including the use of current technologies
7. develop and apply 21st century communication skills in the study of science
8. become critically aware, as global citizens, of the ethical implications of using science and technology
9. develop an appreciation of the possibilities and limitations of science and technology
10. develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Course Schedule:

Topic 1: Cell biology

- 1.1 Introduction to cells
- 1.2 Ultrastructure of cells
- 1.3 Membrane structure
- 1.4 Membrane transport
- 1.5 The origin of cells
- 1.6 Cell division

Topic 2: Molecular biology

- 2.1 Molecules to metabolism
- 2.2 Water
- 2.3 Carbohydrates and lipids
- 2.4 Proteins
- 2.5 Enzymes
- 2.6 Structure of DNA and RNA
- 2.7 DNA replication, transcription, and translation
- 2.8 Cell respiration
- 2.9 Photosynthesis

Topic 3: Genetics

- 3.1 Genes
- 3.2 Chromosomes
- 3.3 Meiosis

- 3.4 Inheritance
- 3.5 Genetic modification and biotechnology

Topic 4: Ecology

- 4.1 Species, communities, and ecosystems
- 4.2 Energy flow
- 4.3 Carbon cycling
- 4.4 Climate change

Topic 5: Evolution and biodiversity

- 5.1 Evidence for evolution
- 5.2 Natural selection
- 5.3 Classification of biodiversity
- 5.4 Cladistics

Topic 6: Human physiology

- 6.1 Digestion and absorption
- 6.2 The blood system
- 6.3 Defense against infectious disease
- 6.4 Gas exchange
- 6.5 Neurons and synapses
- 6.6 Hormones, homeostasis and reproduction

Homework

In general, homework is not assigned in science class. Most work done at home will be studying, finishing projects and assignments, completing readings, etc.

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.

Submission Guidelines

*Guidelines are subject to change. These are general course guidelines and it should be noted that Mrs. Toupin 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, I do not accept submissions anywhere else
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 of 10% per school day will occur for formative late work, and one score down per school day for summative
2. I encourage students to revise their work for credit
3. You 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. YOU MUST NOTIFY ME THROUGH EMAIL when you have submitted late work or revised work
 - a. YOU MUST PUT 'LATE WORK' IN THE SUBJECT LINE
 - b. YOU MUST STATE WHAT ASSIGNMENT WAS SUBMITTED IN THE EMAIL
 - c. I usually don't respond to Late Work emails, they are like a checklist for me to use when grading

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 you are missing class, please notify me through email to ask for work you're missing.
2. It is your responsibility to ask about and complete work you have missed.
3. Please ask for help if you are 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 preferred. 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 1st 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