IB Middle Years Program Year 4 Science
9th grade science, Willows Preparatory School

Course Description:

MYP Science

With inquiry at the core, the MYP sciences framework aims to guide students to independently and collaboratively investigate issues through research, observation and experimentation. The MYP 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 MYP 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 MYP Science are to:

- Understand and appreciate science and its implications.
- Consider science as a human endeavor with benefits and limitations.
- Cultivate analytical, inquiring and flexible minds that pose questions, solve problems, construct explanations and judge arguments.
- Develop skills to design and perform investigations, evaluate evidence and reach conclusions.
- Build an awareness of the need to effectively collaborate and communicate.
- Apply language skills and knowledge in a variety of real-life contexts.
- Develop sensitivity towards the living and non-living environments.
- Reflect on learning experiences and make informed choices.

Course Schedule:

Semester 1:

Unit 1: Heat and Energy in the Earth System.

- *HS-PS3-1:* Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
- *HS-PS3-2:* Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles (objects).
- *HS-PS3-4:* Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
- *HS-ESS2-3:* Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.

Unit 2: Energy in living systems.

- *HS-LS2-3:* Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
- *HS-LS2-5:* Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
- *HS-PS3-3:* Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Unit 3: Atoms, elements and molecules.

- *HS-PS1-1:* Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- *HS-PS1-2:* Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
- *HS-PS1-7:* Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Semester 2:

Unit 4: Chemical reactions-

- *HS-PS1-1:* Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- *HS-PS1-2:* Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
- *HS-PS1-3:* Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.
- *HS-PS1-4:* Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

- *HS-PS1-5:* Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
- *HS-PS1-7:* Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
- *HS-PS3-5:* Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

Unit 5: Chemistry of climate change.

- *HS-PS1-2:* Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
- *HS-ESS3-2:* Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
- *HS-ESS2-2:* Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.
- *HS-ESS2-4:* Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
- *HS-ESS2-6:* Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
- *HS-ESS3-6:* Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
- *HS-ESS3-5:* Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.
- *HS-ET1-2:* Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

MYP Science Content Brief**:** https://www.ibo.org/globalassets/digital-toolkit/brochures/myp-brief_sciences_-2015.pdf

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 criteria2 (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, 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 Timer: 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