6th Grade Science

Willows Preparatory School

Course Information
6th Grade Science WPS
2021-2022
Class Location: Room BLANK

Index

Part 1 – Course Overview

Introduction to Science WPS

As the introductory science course at Willows Prep, incoming 6th grade students have a lot to learn to prepare themselves for the science curriculum in the MYP. In this year, we seek to familiarize students with fundamental concepts in cellular biology, inheritance, physics, climate/earth science, as well as global 21st century issues related to the environment, humanity, and emerging technologies. Furthermore, students will cultivate a richer understanding of the scientific process as a method for producing knowledge with laboratory practicals wherein students are pushed to hypothesize, question, design, and carry out experiments of their own volition – building towards a critical analytical perspective of modern scientific institutions, funding, and practices.

By the end of the Middle Years Program (10th grade @WPS), students will be expected to have completed all High School Next Generation Science Standards (NGSS). This means our students are being built up to be 2 years ahead of their contemporaries by end of 10th Grade. Though challenging, this is also what keeps science so exciting for the gifted students that attend WPS and many resources are available throughout the school both inside and outside of class to help students catch up and stay ahead of this challenging curriculum. A great deal of energy is applied to help 6th grade students meet this challenge in particular, as Science 6 is the introductory science course @WPS.

The Willows Prep MYP Science Program aspires to cultivate compassionate global citizens who are empowered with scientific literacy, skilled in engineering practices, and inspired by their investigations into the hidden beauties of the natural world. We seek to prepare students to be internationally minded, skilled in collaboration, and to feel a sense of grounded agency regarding the ecological and technological challenges facing them in the 21st century. Students will engage in group-based, project-based, and place-based learning to cultivate the skills they need to thrive – along with rigorous academic and socioemotional skills. Taken as a whole, WPS seeks to help students cultivate all these traits such that graduates can become the ethical and scientifically literate leaders of tomorrow.

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.

Part 2 – Unit & Semester Outlines

Unit/ Topic	Course Activities	Assessments/Assignments	Month/ Timeframe
Bodies in Motion	*Kinetic Energy Demo*	*Exam* *Neuroprosthetics Project*	*Sept-Oct*
Extreme Living	*WPS Energy Flux Lab* *Product Testing Lab* *Convection Demo*	*Exam* *Sustainable Buildings Project*	*Nov-Jan*
Nature via Nurture	*Inheritance Lab*	*Exam* *Climate HABs Article and Letter*	*Jan-March*
A Warming World	*Mock Science Conference*	*Exam* *Climate Conservation Project*	*March-May*

Semester 1

Unit 1: Bodies in Motion – *How do animals utilize energy to control their bodies and reorganize the world around them?*

- **MS-PS1-1** - Develop models to describe the atomic composition of simple molecules and extended structures.
- **MS-PS3-1** - Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- **MS-LS1-1** - Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- **MS-LS1-2** - Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- **HS-LS1-2** - Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- **MS-LS1-3** - Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- **MS-LS1-8** - Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Unit 2: Extreme Living – *How can humans understand and adapt to extreme temperatures and live sustainably in a changing world?*

- **MS-PS3-3** - Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- **MS-PS3-4** - Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- **MS-ESS2-4** - Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- **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.
- **MS-ESS2-6** - Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
- **MS-ET1-1** - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- **HS-ET1-1** - Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

Unit 3: Nature via Nurture – *What can algae teach us about the interaction of genetics and the environment?*

- **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-LS1-1** - Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
- **MS-LS1-4** - Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- **HS-LS1-4** - Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
- **MS-LS1-5** - Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- **HS-LS1-5** - Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
- **MS-LS1-7** - Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- **MS-ESS2-5** - Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
- **HS-ESS3-2** - Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Unit 4: A Warmer World – *How do changing climates impact organisms around the world and what can we do about it?*

- **MS-LS1-4** - Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- **MS-ESS3-3** - Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
- **MS-ESS3-5** - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

- **HS-ESS3-5** - Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- **MS-ET1-1** - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- **HS-ET1-1** - Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- **MS-ET1-2** - Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- **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.
- **MS-ET1-3** - Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- **HS-ET1-3** - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

Part 3 - Class Specific Policies and Expectations

Classwork *(Tasks)* and Projects

Tasks, Quizzes, and Tests

Tasks, quizzes, and summatives tests will be submitted *(and graded for formative tasks)* by the end of class each day. If you miss class you are responsible for submitting that assignment in paper copy or online *(depending on the assignment)* within two weeks. Unless prior arrangements are made, the maximum score you can receive on this *Task, Quiz,* or *Test* is a 4 out of 8.

Summative Projects

Summative projects will be submitted on ManageBac before 11:55pm the night they are due unless otherwise stated.

Consequences - If you submit your project late, the score you receive on your project will diminish by ***1 pt*** on the IB Grading Scale for each day it is late.

Limitations Your score will not be diminish lower than a ***4*** due to lateness *(that said, you may receive less than a **4** due to your work being of substandard quality).*

Absolute Deadline Assignments submitted more than a week after the due date will not be accepted unless prior arrangements have been made *(talk to me as soon as possible!)*

Revisions – Revisions will be accepted for summative assignments, but you cannot push a score above a **6** in the IB Grading System with a revision in this course. There will be no grade changes revising formatives but you are welcome and encouraged to do so at your leisure!.

Feedback –

Formatives - Formative work *will not* receive written feedback – all formative feedback will be *live* and *in person*.

Summatives – Summatives will receive a substantive paragraph *(possibly two or three!)* worth of feedback for each student on each project/test on ManageBac. Feedback on errors that were common among the class will be reviewed as well live and in person in addition to written feedback.

Making Up Assessments

If you miss a quiz or exam it is *your responsibility* to schedule a time with Mr. Runyan to retake the exam in question. Failing to reschedule a quiz or exam within a week of the exam being due will result in a zero on that assessment. The max score you can receive on a quiz or exam you did not make prior arrangements for *(at least 24hrs ahead of time with approval from Mr. Runyan)* is a ***4*** on the IB Grading Scale.

Attentiveness and Constructive/Disruptive Behavior

Extra Credit – Students may receive extra credit throughout each semester that will add as a bonus to their formative score. Extra credit **cannot** count against you. It's only positive! If you'd like to improve your formative score, taking extra credit opportunities is an excellent way to do so.

Class Discussions – Exceedingly vibrant, thoughtful, and considerate participation in class discussions ***can always earn you extra credit***, as discerned by the teacher.

Consequences – Poor behavior in class may result in a docking of your formative score in class that week. Some examples of poor behavior include the following:

Defiance - Failure to comply with Teacher's directions – especially when intentional or repeated

Disruptiveness – Distracting other students – especially through incessant chatting/interruption, strange, loud, or shocking behaviors, or class clowning at inappropriate moments.

Disrespectful Behaviors – Acting in such a way as to demean the class, your fellow students, the subject matter, or the teacher.

Inattentiveness – Needing repeated reminders to pay attention *(unless prior discussions on a personalized learning plan have been made)*

Computer Use – Using computer or other electronic devices when devices are supposed to be turned off **and/or** using the computer in a way that is irrelevant to the assignment *(such as video games, social media, or other forms of goofing off on your device)* during class.

Unresponsiveness *(online)* – inability to respond meaningfully to what's going on in class. *(if you're having big issues with this, have your parents send me an email to explain what's going on with your wifi/computer so we can troubleshoot/accommodate!)*

Plagiarism, Cheating, and Academic Integrity

Plagiarism is the practice of copying *(or "near copying")* of sentences, paragraph structures, images, or unique ideas for use in written or oral assessments without giving proper credit to the source.

Cheating is defined as the giving or receiving of illegal help on anything that has been determined by the teacher to be an individual effort. Both are considered serious offenses and will significantly affect your course grade.

Consequences: Cheating and/or Significant Plagiarism on summative assessments (exams and projects) will significantly negatively impact ones score – possibly resulting in a **zero** on the assessment in question. Teacher discretion will determine the severity of the *consequence to your grade* and the *possibility* of revision. All severe instances of plagiarism will be reported.

Part 4 - Schoolwide Policies and Expectations

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.

Part 5 – Final Notes and Signatures

Note to Parents

As an IB World School, we seek to build our students to the highest standards of holistic excellence as learners – both academically and ethically. For students to complete the IB Middle Years Program (MYP – 6th-10th grade) students are expected to achieve High School level *skills*, *content knowledge*, and *conceptual depth/ingenuity* – by the end of Grade 10.

This means that 6th Grade Students at Willows Prep are being built up to eventually be **2 years ahead of standards** *(we use Next Generation Science Standards or NGSS)* **by the end of the MYP**. School work in 6th Grade Science will be rigorous and challenging, but significant and pervasive assistance will be provided to student to help them grow to meet this challenge! Please help your child focus on their *growth* as a young scientist towards this challenge rather than insist on perfection!

Getting an 8 in IB indicates that your child is performing at a level *far beyond* the highest levels assessed at a regular school. Help them feel encouraged to strive for an 8 but not to feel less-than or discouraged. I will be giving continuous feedback regarding their growth as an IB Learner. Help your child feel fantastic as their skills improve month-by-month and year-by-year!

Note to Students

A common misunderstanding among students is that your GPA as a 6th Grader will significantly impact your College/Highschool Admissions Prospects. In short, this is very unlikely for High School and is simply *irrelevant* to college admissions. Colleges and Private High Schools focus far more on your scores a year or two before your application *(7th and 8th for Private High School and 11th-12th for 4-year colleges)* than the scores you received 3+ years before your application.

Instead of obsessing over your **absolute score** *(0 through 8)* in IB on any particular criteria, focus instead on your **growth as a learner**! Are you getting better summative scores then you were last semester? Are you receiving better and better feedback regarding your skills from your teacher week-by-week? These are the most important indications that you're on the right trajectory to excel and succeed in the IB program at WPS! Be positive and *gentle with yourself* and always do your best! You're an excellent kid and I will *always* be here to support you!

Getting an 8 *(and a reassuring note regarding grades in IB)*

In IB, an **8** represents truly stunning/noteworthy achievement that far exceeds age-level expectations. In particular, an 8 represents that a student's work has demonstrated extraordinary *skills, creativity,* and *conceptual fluency* that goes well-beyond the given instructions - *trailblazing their own path in a fully self-directed/passion-driven manner.*

These are the skills that makes one a great scientist. Willingness to break the mold. Deep *conceptual fluency* and *insight* that goes far beyond mere rote memorization. Creativity to see problems in a wholly new light and come to conclusions no one else could come to. And, most of all, passionate exploration of scientific mysteries that yields all the results above.

It is extraordinarily difficult to achieve an 8 unless you find *the passion within yourself* to approach science with this degree of creativity, zeal, and love. IF you want to get an 8, I recommend you pay closer attention to the moments when you feel an inward desire to know more about the world around you – when you feel passion/curiosity well-up inside yourself.

The more you do this, the less you will chase excellence and the more excellence will chase you.

General Information:

If you are having trouble with this class, come to me immediately and I can work with you. If you wait till the end of the marking period, it will be TOO LATE. I will be available to help you understand so you can be successful in this class.

Please check and sign below

_____*I have read the information and I fully understand what I'm expected to do in class.*

Student Signature: _____

Parent / Guardian Signature: _____