



مدارس الظهران الأهلية
Dhahran Ahliyya Schools
مجتمع تعليمي غير ربحي
A not-for-profit learning community



وزارة التعليم
Ministry of Education

IB MIDDLE YEARS PROGRAMME

MYP Science Subject Overview

Vertical Map • MYP 1–5

Academic Year 2026–2027

MYP Science — Subject Overview / Vertical Map (MYP 1–5)							
MYP	Field	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
MYP 1	Theme/Title	States of matter	Energy and Motion	Waves and Electromagnetic Energy	Cellular Structure and Function		
	Next Generation Science Standards (NGSS)	MS-PS1-4	MS-PS3-1 MS-PS3-2 MS-PS3-3 MS-PS3-4 MS-PS3-5	MS-PS4-1 MS-PS2-5	MS-LS1-1 MS-LS1-2 MS-LS1-6 MS-LS1-7		
	# of weeks	9	6	6	11		
	Key Concept(s)	Change	Systems	Relationships	Systems		
	Related Concept(s)	Evidence, Consequences	Balance, Form and Energy	Models	Function, form		
	Global Context	Orientation in space and time	Fairness and development.	Scientific and technical innovation	Identities and relationships		
	Statement of Inquiry	There are evidences that changes in pH resulting from human activities have serious consequences.	By studying forces and forms of energy, we can understand how physical changes affect natural and artificial systems, and how renewable energy can be harnessed to achieve sustainability	The design and use of technology depend on understanding form, function, and the use of models.	Changes in cell shape determine their function, contributing to the classification of living organisms and identifying their patterns across different places and time periods.		
	Content	- Matter and states of matter - Physical properties of matter: density, mass, volume, conductivity - Elements and aoms - Physical & chemical change - Evidence of chemical reaction - Mixtures - Law of mass conversation - Chemical Equation - Acids and bases	- Forces - Gravity - Contact forces - Friction forces - Work - Potential and kinetic energy - Renewable energy	- Waves - Reflection and refraction - Electricity and magnetism - Electric current - Series/parallels connection	- Cell structure - Cell Discovery - Cell Organelles (nucleus, cytoplasm, membrane, wall, chloroplast) - Plant animal - Life cycles of animals and plants - Photosynthesis and cellular respiration - Ecosystems		
	MYP Objectives	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science		
	ATL Skills	Communication Skills: - Use and interpret a range of discipline-specific terms and symbols - Make effective summary notes for studying	Communication skills: - Use intercultural understanding to interpret communication Social: Collaboration skills - Practise empathy	Self-Management skills: Organization skills: - Bring necessary equipment and supplies to class Thinking skills: Critical-thinking skills: - Identify obstacles and challenges	Research skills; Information literacy skills: Access information to be informed and inform others Self-management skills; Organization skills: Keep and use a weekly planner for assignments		
	Assessment Task with criteria	Criterion A Knowing and understanding: Test including questions about states of matter covering all strands of criterion A Criterion B & C: Write a lab report to investigate acids and bases Criterion D: Performance task including research about manufacturing of ships	Criterion A Knowing and understanding: Test including questions about Energy and motion covering all strands of criterion A Criterion B & C: Write a lab report to investigate calculating accelation Criterion D: Performance task including research about renewable energy	Criterion A Knowing and understanding: Test including questions about waves covering all strands of criterion A Criterion B & C: Write a lab report to investigate electrical magnet Criterion D: Performance task including research about electricity in our life	Criterion A Knowing and understanding: Test including questions about Energy and motion covering all strands of criterion A Criterion B & C: Open inquiry (science fair) Criterion D: Performance task including research about genatics treatment		
		Unit #1	Unit #2	Unit # 3	Unit # 4	Unit # 5	
	Theme/Title	Matter	Chemical Reactions and Energy	Energy	Cellular Structure and Function	Ecology and Environment	
		Next Generation Science Standards, NGSS MS-PS1-1 MS-PS1-3 MS-PS1-4 MS-ESS2-4	Next Generation Science Standards, NGSS MS-PS1-2 MS-PS1-5 MS-PS1-6	Next Generation Science Standards, NGSS MS-PS2-1 MS-PS2-2 MS-PS2-3 MS-PS2-4 MS-PS2-5 MS-PS3-1 MS-PS3-2 MS-PS3-3 MS-PS3-4 MS-PS3-5	Next Generation Science Standards, NGSS MS-LS1-1	Next Generation Science Standards, NGSS MS-ESS2-5 MS-ESS2-6 MS-ESS3-5 MS-ESS3-2 MS-ESS3-3 MS-ESS3-4	
	# of weeks	6	5	11	5	5	
	Key Concept(s)	Change	Change	Change	Systems	Relationships	
	Related Concept(s)	Form - Energy	Function - Evidence	Consequences, Energy	Functions - Models	Transformation - Development	
	Global Context	Scientific and technical innovation	Fairness and development	Globalization and sustainability	Scientific and technical innovation	Orientation in time and space	
	Statement of Inquiry	Studying the changes of state of matter and the forms of energy involved in those changes has a great impact on the industrial development.	As people have used chemical reactions, their society has changed and developed.	Man's ever-increasing need for energy change has a range of consequences.	Discoveries made using new techniques can change our understanding of the natural world.	The Earth has been transformed by slow processes that still continue today. Which creates the conditions necessary for different types of specious and leads to a better understanding of our own planet.	

MYP Science — Subject Overview / Vertical Map (MYP 1–5)							
MYP	Field	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
MYP 2	Content	-Types of mixtures -Separation techniques Classifying mixtures types of mixtures [solutions, oils, alloys, emulsions] -Exploring purification: separation techniques; solids from solids; solids from liquids including filtration; liquids from liquids including distillation; dissolved substances including chromatography; osmosis -Solution (saturated) (aqueous, solvent, solute) solubility -Sub atomic particles: protons, neutrons and electrons -Define, and compare and contrast, atoms, molecules, elements and compounds. -Define atomic number and mass number.	-Types of chemical reaction -Acid/Base reaction -Acid/Base -Salts formation -pH scale -Indicators (litmus, universal, phenolphthalein) -Conductivity -Concentrated, diluted, strong and weak acids and bases -Household detergents	-Forces -Friction -Gravity -Unbalanced forces -Newton's second law -Elastic -Collision -Force as a relationship between cause and consequence that can be represented by an arrow -Contact and non-contact interactions. -Friction as an everyday interaction -Thermal energy -Temperature -Transfer -Conduction -Conversion -Heat as a form of energy -Mechanical equivalent of heat -Concept of temperature -Scales of temperature -Heat transfer: conduction, convection and radiation - Specific heat -Thermal expansion (linear, superficial and volumetric) -Problems in relation to temperature scales and thermal expansion -Conductivity -Magnetic Field -Motion - Distance -Speed -Velocity -Acceleration -Define distance, time, speed and acceleration. -Define force using the relationship between cause and consequence. -Plot graphs of distance against time and speed against time, based on given data. -Explore real-life situations using kinematics and force concepts and the equation: speed = distance/time -Use kinematics concepts and graphs to develop experimental work according to the student's level. -Solve simple problems involving kinematics.	-Cell theory -Classification -Linnaeus taxonomic scale -Organisms in each rank share characteristics. -Eukaryotes are classified into four kingdoms: Animalia, Plantae, Fungi, and Protocista . A fifth kingdom for prokaryotes is Monera. -Organisms that can reproduce with one another and produce fertile offspring are members of the same species. -Characteristics of the five groups of vertebrates are used to classify mammals, birds, amphibians, reptiles and fish. -Devices -Single and multicellular -Describe the range of cells in a leaf section. -Interpret microscope slides of cells. -Interpret microscope slides or micrograms of cells. -Understand that cell size is limited. -Learn to use and care for a light microscope safely and properly.	-Climate -Rocks -Solar System -Tracking some of the changes that occurred to the Earth as a result of human activity and exploring the natural hazards that may occur on Earth and how to predict them. -Determining the sources of natural resources. -Food chain -Ecosystems -Climate -Carbon cycle -Natural resources -Biodiversity -Changes -Renewable energy -Petrochemistry -Atmospheric layers -Green house effect -Water cycle -Weather -Climate	
	MYP Objectives	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating	A. Knowing and understanding	D. Reflecting on the impacts of science	
	ATL Skills	Research skills (Information Literacy) Make connections between various sources of information Thinking skills (Critical) Interpret data	Communication skills (Communication) Negotiate ideas and knowledge with peers and teachers Social Skills (Collaboration) Listen actively to other perspectives and ideas	Self-management (Organisation) Plan short- and long-term assignments; meet deadlines Thinking skills (Creative) Apply existing knowledge to generate new ideas, products or processes	Thinking skills (critical) Analyse complex concepts and projects into their constituent parts and synthesize them to create new understanding Communication Skills (Communication) Use and interpret a range of discipline-specific terms and symbols	Research skills (Media Literacy) Make informed choices about personal viewing experiences Self-management skills (Reflection) Develop new skills, techniques and strategies for effective learning	
	Assessment Task with criteria	A. Knowing and understanding (a paper/pen test where the students apply their knowledge on matter and its properties as well as mixtures and their separating methods based on criterion A 3 strands). B. Inquiring and designing / C. Processing and evaluating (Students conduct a lab experiment and submit a lab report on creating mixtures and separating them correctly) D. Reflecting on the impacts of science (students create a physical poster to investigate one chemical element and explain how it affects people and the environment).	A. Knowing and understanding (a paper/pen test where students apply their knowledge on chemical and physical change and signs of chemical reactions based on criterion A 3 strands) B. Inquiring and designing / C. Processing and evaluating / (Open investigation regarding to submit a lab report based on the students science fair topics and lab experiments) D. Reflecting on the impacts of science (Open inquiry to submit an essay regarding the students science fair topics)	A. Knowing and understanding (a paper/pen test where the students apply their knowledge on energy and forces vased on the criterion A 3 strands) B. Inquiring and designing / C. Processing and evaluating (submission of a lab report based on a lab experiment on how resistance affects the rate of falling (acceleration) of an object)	A. Knowing and understanding (a paper/pen test where the students apply their knowledge on cells and cell theory based on the criterion A 3 strands)	Assessment Task with criteria D. Reflecting on the impacts of science (Inquiry and research to submit an essay investigating how biodiversity in local ecosystems contributes to environmental stability and health and identify actions to protect it.)	
MYP 3		Unit # 1	Unit # 2	Unit # 3	Unit # 4	Unit # 5	
	Theme/Title	Cells and Tissues	Human Body Systems	Waves and its applications	Earth, Space and Stars	Atomic and Nuclear Structure	
		Next Generation Science Standards, NGSS MS-LS1-1 MS-LS1-2 MS-LS1-3	SNext Generation Science Standards, NGSS MS-LS1-1 MS-LS1-3 MS-LS1-8	Next Generation Science Standards, NGSS MS-PS4-1 MS-PS4-2 MS-PS4-3	Next Generation Science Standards, NGSS MS-ESS1-1 MS-ESS1-2 MS-ESS1-3	Next Generation Science Standards, NGSS MS-PS1-1 HS-PS1-1 HS-PS1-8	
	# of weeks	7	10	7	6	5	
	Key Concept(s)	system	Relationships	Key Concept(s) Change	Systems	Relationships	
	Related Concept(s)	Function, Relationships	Form, Balance and Function	Patterns - Movement	الفضاء- الطاقة Energy	Patterns - Models	
	Global Context	Scientific and technical innovation	Identities and Relationships	Scientific and Technical Innovation	Globalization and sustainability	Scientific and Technical Innovation	
	Statement of Inquiry	. Cells in the body form an interconnected system of relationships between structure and function, and scientific and technological innovation has contributed to further discoveries regarding these relationships.	The structure of cells and organs determines their functions within biological systems to sustain life.	Changes in the direction of motion of particles in a medium generate different wave patterns that are used in various areas of life.	The cosmic system is composed of various components whose continuous movements give rise to diverse patterns of natural phenomena.	The relationships between models and patterns of atomic structure demonstrate scientific and technical innovation.	
	Content	- Scientific method - Write a lab report - The cellular theory - Cell is the building blocks of a living organism - Living organisms are unicell or multicells - Structure and function of plant and animal cells - The difference between prokaryotes and eukaryotes - Concept of tissue	– Digestive system – Circulatory system – Respiratory system – Excretory system – Muscular system – Nervous system – Hormonal system – Immune system	- The concept of a wave. - Types of waves and their characteristics: 1- Mechanical waves 2- Electromagnetic waves. - Reflection and refraction of light.	– Origin of the Solar System – Motion of the Solar System – Components of the Solar System: galaxies, stars, and planets – Phenomena resulting from Earth's revolution around the Sun	- The role of scientists in developing atomic models - Components of the atom - Isotopes - Nuclear reactions - Electron configuration - The periodic table	
	MYP Objectives	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	

MYP Science — Subject Overview / Vertical Map (MYP 1–5)							
MYP	Field	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	ATL Skills	Self-Management Skills Reflection skills; Keep a journal to record reflections Organization skills; Create plans to prepare for summative assessments (examinations and performances) Research Skills: Information literacy skills; Understand and use technology systems	Self-management skills: Organization skills; Set goals that are challenging and realistic Media literacy skills: Communicate information and ideas effectively to multiple audiences using a variety of media and formats	Communication skills: Negotiate ideas and knowledge with peers and teachers Research Skills: Information literacy skills; Process data and report results	Social Skills: Collaboration skills; Exercise leadership and take on a variety of roles within groups Thinking Skills: Critical-thinking skills; Interpret data	Thinking Skills: Critical-thinking skills; Use models and simulations to explore complex systems and issues Research Skills: Information literacy skills; Collect, record and verify data	
	Assessment Task with criteria	Criterion A Knowing and understanding: Test including questions about cells and tissues covering all strands of criterion A Criterion D: Performance task including research and modelling the cells Criterion B & C: Write a lab report to investigate photosynthesis (Effect of light color on the intensity of photosynthesis)	Criterion A Knowing and understanding: Test including questions about human body systems covering all strands of criterion A Criterion B & C: Write a lab report to investigate organic compounds Criterion D: Performance task including research on the required imbalances and disorders affecting the body's systems.	Criterion A Knowing and understanding and Criterion D: Performance task including research on applications of waves in our life Criterion B & C: Write a lab report on the properties of light	Criterion A Knowing and understanding: Test including questions about earth and space covering all strands of criterion A Criterion B & C: Science fair (open inquiry) Criterion D: Performance task including writing an essay based on research	Criterion A Knowing and understanding: Test including questions about atomic structure covering all strands of criterion A Criterion B & C: write a lab report	
MYP 4 D		Unit # 1	Unit #2	Unit #3	Unit #4	Unit # 5	Unit # 6
	Theme/Title	Structure and Properties of Matter Atomic Structure	Chemical Reactions and Energy	Motion , Mechanics and Energy	Electricity	Cellular Structure and Function	Ecology and Environment
	Next Generation Science Standards	NGSS NGSS:MS-PS2-1 MS-PS2-3 MS-PS1-4 MS-PS3-4 MS-PS3-5	MS-PS1-1 MS-PS1-2 MS-PS1-4	MS-PS1-3 MS-PS1-4	MS-PS 2-3 MS-PS 2- 5	HS-LS1-1 HS-LS1-4 HS-LS3-1 HS-LS3-2	NGSS HS-LS1-1 HS-LS1-2 HS-LS1-5 HS-LS1-6 HS-LS1-7
	# of weeks	7	4	7	6	8	3
	Key Concept(s)	Systems	Relationships	Change	Communication	Relationships	Systems
	Related Concept(s)	Models, Patterns	Form, Function	Movement, Energy	Form, Function	Form, Function	Interactions, Balance
	Global Context	Scientific and Technical Innovation	Globalization and Sustainability	Scientific and Technical Innovation	Globalization and Sustainability	Identities and Relationships	Globalization and Sustainability
	Statement of Inquiry	Scientific models of atomic structure, periodic patterns, and chemical bonding reveal how the form and function of matter as a system drive innovation and influence its relationship with society and the environment.”	he way atoms bond determines the form and function of substances, influencing their relationships with society and the environment.	"Energy transformations, forces, and motion reveal how change within systems drives scientific and technological innovation to meet human needs sustainably."	Waves and light are forms of energy whose properties enable communication and personal expression across cultures.	Understanding the form and function of cells helps us recognize the relationships that define life and our own identities as living organisms.	Ecosystems function as balanced systems where interactions determine sustainability and survival in a global context.
	Content	- Atomic structure - Isotopes and their uses - Electron configuration - Valency - Calculating relative mass in compounds - Periodic trends - Lewis - Structure and bonding - Covalent bond - Ionic bond - Ions formation - Metallic bonds, Alloys - Electronegativity - Bonds are formed to achieve stability. - Positive ions (cations) form by metals losing valence electrons. - Negative ions (anions) form by non-metals gaining electrons. - The number of electrons lost or gained is determined by the electron configuration of the atom. - Single, double and triple covalent bonds involve one, two and three shared pairs of electrons, respectively. - The 'octet rule' refers to the tendency of atoms to gain a valence shell with a total of eight electrons.	- Chemical formulas - Types of Chemical reactions + balancing - Conservation of mass - Types of chemical reaction: single-/double displacement reaction, decomposition, neutralization, synthesis, combustion reaction, endothermic and exothermic reactions - Identify the names and formulas for common laboratory acids and alkalis. - Balancing chemical equations (Limited to simple compounds and elements or counting atoms/particles in a diagrammatic problem) - Rate factors - Activation Energy - Enzymes - Catalysts - Reaction rate and collision theory - Factors affecting the rate of reaction: nature of reactants, concentration, surface area, catalyst, temperature - Equilibrium • Physical • Chemical • Le Chatelier's principle: concentration,temperature and pressure changes,effect of a catalyst	-Kinematics: describing motion , steady-speed model and constant acceleration model -Kinematic variables: steady-speed model, constant acceleration model, speed against time and velocity against time graphs -Concept of force and Balanced forces, frictional force: force as a cause–consequence relationship; the frictional force and its importance in motion; air resistance -Gravitational force: universal law of gravitation, acceleration due to gravity -Newton's First Law -Inertia -Newton's Second law -Newton's Third Law -Gravitational forces, Gravity -The human body as an energy source for simple collisions and airplanes -Newton's second law as the rate of change of momentum •Air resistance -Collisions and explosions -Energy stores and transfer energy resources -Conservation of Energy -Kinetic Energy, Work, potential Energy, Power, Efficiency,	-Electric current -Flow current -Voltage -Resistance -Direct alternating -Series Parallels -Ohm's Law -Conductivity -Electric charge -Circuit symbols -Voltage and current in series and parallel circuits -Calculations for a circuit -The resultant resistance in series and parallel circuits -Household electricity -Uses of electricity in the wider community -Use and explain the terms "current" (I), "potential difference" (V) and "resistance" (R). -Use and draw circuits using the recognized symbols. -Use the equation $V = IR$ to calculate the current through a resistor when a known value of potential difference is applied. -Calculate the combined resistance of different combinations of resistors using the two equations $RT = R1 + R2$, for resistors in series, and $1/RT = 1/R1 + 1/R2$, for resistors in parallel. -Understand the difference between ohmic and nonohmic resistors and draw a graph of each	-Cell structure, organelles and functions - Cell division - DNA, genes and chromosomes - Inheritance and Punnett squares - Protein synthesis and genetic modification - Sexual and asexual reproduction - Evolution and adaptation - Classification and domains of life - Ecosystems, habitats and niches - Food chains, food webs and energy transfer - Nutrient, carbon and nitrogen cycles - Population interactions and limiting factors - Biodiversity, speciation and extinction - Ecological succession - Human impacts, conservation and sustainability - Extinction	- Biological molecules and nutrients - Carbohydrates, proteins and fats - Monomers, polymers and amino acids - Cell transport - Enzymes and factors affecting enzyme activity - Metabolism and ATP - Balanced diet and malnutrition - Energy content of food - Photosynthesis - Aerobic and anaerobic respiration - Overview of body systems
	MYP Objectives	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding / D. Reflecting on the impacts of science	A. Knowing and understanding / D. Reflecting on the impacts of science
	ATL Skills	Thinking skills (critical)(Gather and organize relevant information to formulate an argument) Research skills (Information literacy) (Process data and report results)	Social Skills (Collaboration skills)(Listen actively to other perspectives and ideas) Communication skills; Make effective summary notes for studying	Thinking skills (creative)(Make unexpected or unusual connections between objects and/or ideas) Research skills: media literacy; Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of sources and media (including digital social media and online networks	Communication skills (communication) Use and interpret a range of discipline-specific terms and symbols Self mangment skills (Organization skills) Plan strategies and take action to achieve personal and academic goals	Communication: Communication skills; Read critically and for comprehension Social: Self-management; Bring necessary equipment and supplies to class	Thinking Skills: Critical thinking; Use models and simulations to explore complex systems and issues Social Skills: Collaboration skills; Encourage others to contribute
	Assessment Task with criteria	Criterion A Knowing and understanding students will Explain key concepts of atomic structure, electron configuration, valency, periodic trends, and the uses of isotopes .Apply atomic structure and stoichiometry concepts to calculate relative atomic mass, formula mass, and predict chemical formulas. Analyse isotopic data and periodic trends to evaluate atomic stability, element identity, and chemical reactivity. Student will Explain bonding models and Lewis structures, apply stability principles to calculate formulas and predict properties, and analyse electronegativity data to evaluate material structures and behavior. Criterion B. Inquiring and designing Students will formulate a hypothesis and plan an investigation to explore how changing the percentage of an isotope affects the average atomic mass. Criterion C – Processing and Evaluating Students will process and analyze data to determine the relationship between isotope percentage and average atomic mass, then evaluate their results and conclusion. Criterion D Students will investigate and evaluate a real-world environmental chemistry issue by applying scientific knowledge from the MYP Chemistry textbook and beyond, and produce a 600–800 word research report.	A. Knowing and understanding Explain reaction types, collision theory, and equilibrium principles, apply mass conservation to balance equations and predict reaction rates, and analyse experimental data to evaluate kinetics and system shifts. Criterion B. Inquiring and designing Students will formulate a hypothesis and plan an investigation to Formulate a testable hypothesis and design a safe, detailed experimental procedure to investigate how changing reaction conditions (such as substrate concentration, temperature, or pH) affects the rate of catalase activity and oxygen gas production. Criterion C (Processing and Evaluating): Collect and present oxygen production data, interpret trends in catalase reaction rates using scientific reasoning, and evaluate the experimental method to suggest valid improvements.	Criterion A: Knowing and understanding Students demonstrate knowledge and understanding of physics concepts by applying Newton's laws of motion, kinetic theory, gas laws, latent heat, and wave behavior to explain physical phenomena and solve quantitative problems. Students demonstrate knowledge and understanding of physics concepts by applying the principles of kinematics, energy conservation, gravitational and frictional forces, and momentum conservation to describe motion and solve quantitative problems. Criterion D: Reflecting on the impacts of science Students evaluate how principles of heat transfer, mechanical advantage, and digital electromagnetic technology are applied to design everyday objects and modern innovations to address real-world needs.	Criterion A: Knowing and understanding Students demonstrate knowledge and understanding of physics concepts by defining electrical variables (current, potential difference, resistance), drawing circuit diagrams with standard symbols, calculating current, voltage, and combined resistance in series and parallel circuits using $V = IR$ and resistance formulas, and distinguishing between ohmic and non-ohmic conductors using current–voltage graphs. Criterion BInquiring and designing Students design scientific investigations to test electrical circuits by formulating testable hypotheses, manipulating independent variables (such as voltage or resistance), controlling relevant variables, and outlining clear procedures to measure current, potential difference, and resistance accurately and safely. Criterion C: Processing and evaluating Students collect, record, and process quantitative circuit data—including plotting I–V graphs for ohmic and non-ohmic components—to identify patterns, analyze combined resistances, draw valid conclusions, and evaluate the reliability and limitations of their experimental setup.	Criterion A : Knowing and Understanding Students will outline and explain key scientific concepts regarding cellular biology, genetics, and ecosystem dynamics to solve problems and evaluate scientific information. Criterion D: Reflecting on the Impacts of Science Students will summarize and evaluate the ways in which science is applied—such as in genetic modification, conservation, and sustainability—to analyze its real-world implications on societies and the environment.	Criterion A: Knowing and Understanding Students will explain and apply scientific knowledge regarding biological macromolecules, enzymatic reactions, cell transport, and metabolic processes (photosynthesis and respiration) to solve problems and evaluate physiological phenomena. Criterion D: Reflecting on the Impacts of Science Students will summarize and evaluate the implications of scientific knowledge regarding human nutrition, diet, and metabolic health to analyze how choices and scientific applications affect individual well-being and societal health.
	Theme/Title	Motion in one Dimension	Electricity and Magnetism	Atomic and Nuclear Structure	Chemical Equations and Formulas	Cells and Cellular Homeostasis	Introduction to Genetics

MYP Science — Subject Overview / Vertical Map (MYP 1–5)							
MYP	Field	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
MYP 4 Masarat	Next Generation Science Standards, NGSS	- MS-PS2-1 - MS-PS2-2	HS-PS2-5 HS-PS3-3 HS-PS3-5	NGSS MS-PS1-1 HS-PS1-1 HS-PS1-8	NGSS MS-PS1-5 HS-PS1-2 HS-PS1-7	NGSS MS-LS1-2 HS-LS1-1 HS-LS1-2 HS-LS1-3	NGSS MS-LS3-1 MS-LS3-2
	# of weeks	7	5	6	6	6	6
	Key Concept(s)	Relationships	System	Relationships	Change	System	Relationships
	Related Concept(s)	Movement	Development	Models - Patterns	Transformation - Interaction	Function - Balance	Form - Evidence
	Global Context	Scientific and technical innovation	Fairness and development	Scientific and technical innovation	Orientation in space and time	Personal and cultural expression	Identities and relationships
	Statement of Inquiry	Our understanding of the relationship between Newton's laws of motion and technological development led to scientific and technical advances in vehicle safety features, which in turn helped reduce road fatalities and accidents	The development of electrical systems has shaped the modern world and created new horizons	The relationships between models and patterns reveal scientific and technical innovation.	Change is the result of processes of transformation, interaction, and exchange between systems.	The function of a system creates an environment that allows skill, innovation, and beauty to be expressed.	The different relationships between forms are evidence that shapes identities.
	Content	- Scalar and vector quantities - Distance and displacement - Speed and acceleration - The concept of forces and their types - Newton's laws of motion	- Electrical energy - Electric field - Series and parallel circuits - Ohm's law - Magnetism - Magnetic fields - Electromagnetism	- Atomic models - Components of the atom - Isotopes and nuclear reactions - Electron configuration - The periodic table - Properties of periodic table - Metals, metalloid and non-metals	- Atoms, molecules, and compounds - Ionic bonds - Covalent bonds - Word and symbolic chemical equations - Types of chemical reactions	- Cell theory - Metabolic processes - Cellular respiration (and photosynthesis) - Cellular transport (passive and active transport) - Cell division (mitosis and meiosis) and reproduction (sexual and asexual)	- Cell cycle - Chromosome structure and alleles - DNA and protein synthesis - Mendel's first law and human heredity - Mutation and genetic diversity
	MYP Objectives	B. Inquiring and designing C. Processing and evaluating D. Reflecting on the impact of science	A. Knowledge and understanding B. Inquiring and designing C. Processing and evaluating	A. Knowledge and understanding B. Inquiring and designing C. Processing and evaluating D. Reflecting on the impact of science	A. Knowledge and understanding B. Inquiring and designing C. Processing and evaluating D. Reflecting on the impact of science	A. Knowledge and understanding B. Inquiring and designing C. Processing and evaluating	A. Knowledge and understanding B. Inquiring and designing C. Processing and evaluating D. Reflecting on the impact of science
	ATL Skills	Thinking skills Creative-thinking skills – Applying existing knowledge to generate new ideas, products, or processes. Critical-thinking skills– Interpreting data	Thinking skills Creative-thinking skills – Use brainstorming and visual diagrams to generate new ideas and inquiries Communication Communication skills–Give and receive meaningful feedback	Research skills (Information-literacy skills) – Collecting, recording, and verifying data (Media-literacy skills) – Communicating information and news effectively to multiple audiences using a range of media and formats	Communication (Communication skills) – Exchanging ideas with multiple audiences using a range of digital environments and media. -Taking useful notes in class.	Research skills: Information-literacy skills – Collecting data and presenting results. Media-literacy skills – Making informed choices about personal experiences for viewing	Social skills: Collaboration skills– Listening actively to the perspectives and ideas of others. Self-management skills: Reflection skill – Considering content
	Assessment Task with criteria	Criterion B & C: Lab report Criterion D: Performance task (applications of Newton's laws in daily life)	Criterion A: Paper and pencil test including questions about electricity and magnetism covering all strands of criterion A Criterion B & C: Lab report (series and parallel circuits)	Criterion A: Paper and pencil test including questions about atomic structure covering all strands of criterion A Criterion B & C: Lab report (science fair project) Criterion D: Performance task (nuclear reactions)	Criterion A: Paper and pencil test including questions about chemical equations covering all strands of criterion A Criterion B & C: Lab report (types of chemical reactions) Criterion D: Performance task (chemical reactions and energy)	Criterion A: Paper and pencil test including questions about cells and homeostasis covering all strands of criterion A Criterion B & C: Lab report (Cellular respiration)	Criterion A: Paper and pencil test including questions about genetics covering all strands of criterion A Criterion B & C: Lab report (DNA extraction from fruits) Criterion D: Performance task (Research task (human racial variation and identities))
MYP 5 - Chemistry		Unit # 1	Unit # 2	Unit #3	Unit #4		
	Theme/Title	The Chemistry of Atoms	Chemical Reactions	Transfer of subatomic Particles	Organic Chemistry		
	Next Generation Science Standards	NGSS MS-PS1-1 HS-PS1-8 HS- PS1- 1 HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	NGSS HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-7	NGSS HS-PS1-2 HS-PS1-4 HS-PS1-5 HS-PS1-6 HS-PS1-7	NGSS HS-LS1-6 HS-LS1-7 HS-PS1-1 HS-PS1-2		
	# of weeks	5	12	8	9		
	Key Concept(s)	Relationships	Change	Change	Systems		
	Related Concept(s)	Interaction, function	Balance	Transfer	Condition		
	Global Context	Identities and relationships	Orientation in Space and Time	Globalization and Sustainability	Scientific and Technical Innovation		
	Statement of Inquiry	Chemical and physical properties reveal the relationships and energy within and between atoms. By studying periodic trends and electron energy, we can understand and predict how elements behave and interact.	Physical and chemical changes require the transfer of kinetic energy between particles of matter over time, which affects the space they occupy.	The chemical industry has introduced changes that influence global interactions, with both beneficial and detrimental environmental consequences.	When matter undergoes change, we notice patterns of similarities and differences that help us develop models to understand the relationships involved.		
	Content	- Write different methods of representing patterns of electrons. - Understand the trends in the periodic table. - Find out how different types of bonding affect physical and chemical properties. - Explain and identify the types of bonds. - Draw the VSEPR model for molecules and identify their polarity. - Explore the relationship between bond types in molecules and the location of their elements in the periodic table. - Explore how bonding relationships, including intermolecular forces, affect macromolecular properties of substances. - Understand the trends in the periodic table.	- Endothermic and exothermic reactions - Bond energy calculations - Determining enthalpy of neutralisation - Intro to entropy (explanatory model) - Enthalpy of vaporisation - Energy changes (transformation) - Temperature and heat - Describing the difference between physical and chemical changes in terms of energy - Qualitative and quantitative measurements. - Units of energy - Combustion as an exothermic reaction - Difference between complete and incomplete combustion - The role of fossil fuels in our modern society - Bond breaking as an endothermic and bond making as an exothermic process - Heat capacity and specific heat capacity - Using calorimetry to measure changes in heat (enthalpy) and determine the enthalpy change for a chemical process -Concept of equipment accuracy - Balancing Chemical Reaction - Kinetic theory - The mole concept and chemical calculations - Molar mass/ molar volume - Avogadro's number - Limiting reactant - Estimation/ scale/ precision	- Concept of equilibrium -Impacts of industrial chemistry on Earth's systems -Acid and Base theories -Formation of salts, uses of salts -Indicators -Titration -Neutral solutions -Acid- base reactions, titration - Comparing which is more corrosive (acid or base) - Acids and bases in the Periodic table - Investigating oxides - Redox reactions - Reactivity series - Extraction of metals - Electrochemical cells - Obtaining electricity chemically (Daniell cells) - Calculation of energy produced - Electrolysis/ Daniell cell electrochemicals - Corrosion and corrosion protection redox reactions	- Analysis of organic compounds - IUPAC naming - Alkanes - Alkenes - Alcohols - Carboxylic acids - Esters - Structural formulas - Isomers - Identification of the following: alkane, alkene, alcohol, carboxylic acid - Nomenclature for straight-chain organic molecules - Combustion reactions - Fossil fuels - Crude oil - extraction distillation of crude oil investigating lubricants (B/C) - Cracking - Creativity with polymers - Making soaps - Polymers (links given to reactions) - Classifying plastics - Alternatives to/reducing plastics		
	MYP Objectives	A. Knowing and understanding / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding		
	ATL Skills	Research Skills (Information Literacy) Make connections between various sources of information Thinking skills (Critical) Interpret data	Thinking skills (Creative) Apply existing knowledge to generate new ideas, products or processes Social skills (Collaboration) Listen actively to other perspectives and ideas	Thinking skills (Critical) Analyse complex concepts and projects into their constituent parts and synthesize them to create new understanding Communication Skills (Communication) Negotiate ideas and knowledge with peers and teachers	Social Skills (Collaboration) Exercise leadership and take on a variety of roles within groups Self-management skills (Organisation) Plan short- and long-term assignments; meet deadlines		

MYP Science — Subject Overview / Vertical Map (MYP 1–5)							
MYP	Field	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	Assessment Task with criteria	Written Assessment: Criterion A: The assessment will include questions that covers different levels of understanding, analysis, and application on atomic structure and electron configuration. Criterion D: The students will do research and write an essay on the chemistry week topic investigating the hidden chemistry of spices and communicate how scientific knowledge about their chemical compounds influences society, the environment, and culture.	Written Assessment: Criterion A: The assessment will include questions that covers different levels of understanding, analysis, and application on chemical reactions and balancing chemical equations. Criterion B and C: The students will prepare, analyse experimental data and draw conclusions and submit lab reports on chemistry week's experiments regarding the formations of different chemical compounds.	Written Assessment: Criterion A: The assessment will include questions that covers different levels of understanding, analysis, and application on acids/bases and transfer of electrons in different chemical reactions. Criterion B and C: The students will prepare, analyse experimental data and draw conclusions and submit lab reports after conducting experiments on strong acids and bases. Criterion D: The students will do research and write an essay on evaluating different methods of transporting and disposing of radioactive waste produced from nuclear fission and recommend the safest and most sustainable solution based on scientific evidence.	Written Assessment: Criterion A: The assessment will include questions that covers different levels of understanding, analysis, and application on organic matter and its formations as well as the composition of organic compounds.		
MYP 5 - Biology		Unit # 1	Unit # 2	Unit # 3	Unit # 4		
	Theme/Title	Function	Movement	Interactions	Balance		
	Next Generation Science Standards, NGSS	MS-LS1-1 MS-LS1-2 MS-L1-3	Next Generation Science Standards, NGSS MS-LS1-3 MS-LS1-7 HS-LS1-2	Next Generation Science Standards, NGSS MS-LS1-8 MS-LS1-3	Next Generation Science Standards, NGSS MS-LS1-3 MS-LS1-8 MS-LS1-5		
	# of weeks	10	10	8	7		
	Key Concept(s)	Systems	Change	Relationships	SYSTEM		
	Related Concept(s)	Function	Environment	Interaction	Balance		
	Global Context	Orientation in Space and Time	Fairness and Development	Identities and Relationships	Fairness and Development		
	Statement of Inquiry	Each component in a system must perform its specific function at the right time and place for the system as a whole to be successful.	The changes in the weather patterns caused by current economic activity may not be fair to future generations.	When two or more individuals interact, they form relationships that, over time, impact and contribute to their identity	Development is only sustainable if systems remain in balance.		
	Content	- The Structure of Cell - Functions of cells of the membrane, cytoplasm, nucleus, mitochondria and ribosome - Specialized Cells, - Cell differentiation and cell communication - Properties of living and non-living things. Human digestive system and the function of each of its organs. - Types of sensory receptors . - Structure of eye and ear, and the functions of each of its parts.	- Osmosis - Diffusion - Tropism - Transpiration and Translocation - Gas exchange - Transport and circulation. - Gas exchange and transpiration in leaves of plants from the roots to the leaves. - Movement of water and sugar through plants from the roots to the leaves. - Pumping of booold by the heart . - Role of arteries and veins. working together of muscles and bones to cause movement. - The movements involved in the gas exchange in humans. - Types of movements occur in plants. - Investigatons on the movement of plants and choice of habitat in invertebrates. - Adaptation of organisms to tolerate wind, waves and other movements of air and water.	- Nervous System. - Competition. Pathogens/Parasites. - Predator/Prey. Interdependency. - Transmission of signals by nerve fibers. - Stimulus-response in a reflex action. - Voluntary and involuntary actions. - Use if synapses in making descisions. - Types of relationship between species in an ecological community. - Predaters and parasites. - Prevalence of cheating in social animals	- Homeostasis - Hormones - Ecosystem - Biogeochemical Cycles		
	MYP Objectives	A. Knowing and understanding	B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding /B. Inquiring and designing / C. Processing and evaluating / D. Reflecting on the impacts of science	A. Knowing and understanding / D. Reflecting on the impacts of science		
	ATL Skills	Thinking Skills (Creative Thinking), Identify obstacles and challenges Self Management Skills (Organization), Managing time, tasks, and deadlines effectively.	Research Skills: (Information Literacy) Make connection between various sources of information	Thinking Skills (Critical Thinking) - Interpreting data Communication Skills (Communication) Share ideas with multiple audiences using a variety of digital environments and media	Thinking Skills: (Critical Thinking)- Analyse complex concepts and projects into their constituent parts and synthesize them to create newunderstanding Social Skills: (Collaboration) Manage and resolve conflict, and work collaboratively in teams		
	Assessment Task with criteria	Assessment Task with criteria: Students will be assessed on Criteria A - Knowing and understanding. Paper based test will be provided to assess students understanding of 'structure and function' of cells.	Students will be assessed on the following Cirteria Criteria B:Inquiring and designing- Students will formulate a testable hypothesis and design an experiment to test the process of diffusion. Criteria C. Processing and evaluating - Lab on Diffusion and Osmosis (Criterion D): The students will do research and write an essay to evaluate 'effects of smoking, pollution, or altitude on respiratory health and the technology used to support patients.	Criterion A: Knowing & Understanding Students will be assessed on their understanding of the roles of receptors, neurons, and effectors in coordinating responses to stimuli. Criterion C: Processing & Evaluating Students will Interpret, analyse and explain reflex pathways and conditioned reflexes using scientific evidence.	Criterion A: Knowing and Understanding. Students will be assessed on their understanding and explaining the reproductive processes and life cycles that contribute to continuity and variation within species. Criterion D: Reflecting on the Impacts of Science. Students will do research and produce a reflective essay evaluating the implications of reproductive technologies such as cloning.		