2019-2020 Subject Overview for MYP Biology 1

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Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP Subject group objective(s)	ATL skills & AVID strategies	Content (topics, knowledge, skills)
Ecology	Systems	Environmen t, Energy and Interaction	Orientation in Time and Space	An environment's energy and occupants interact in time and space to create a complex system.	Sciences Objective B: Inquiring & Designing iii. Sciences Obj B - explain how to manipulate the variables & explain how data will be collected iv. Sciences Obj B - design scientific investigations Sciences Objective C: Processing & Evaluating iii. Sciences Obj C - evaluate the validity of a hypothesis based on the outcome of t he scientific investigation v. Sciences Obj C - explain improvements or extensions to the method	research skills	Matter tends to be cycled within an ecosystem, while energy is transformed and eventually exits an ecosystem (SC09-GR.HS-S-2-GL E.1)
Population Dynamics	Relations hips	Patterns and Balance	Globalization and Sustainability	Patterns and balances within a population determine relationships that are affected by globalization and sustainability.	Sciences Objective C: Processing & Evaluating i. Sciences Obj C - present collected & transformed data ii. Sciences Obj C - interpret data & explain results using scientific reasoning	Communi cation skills	• The size and persistence of populations depends on their interactions with each other and on the abiotic factors in an ecosystem (SC09-GR.HS-S-2-GL E.2)
Biochemistry	Systems	Form and Patterns	Scientific and Technical Innovation	Biochemical systems can be broken down into forms and patterns that dictate function.	Sciences Objective A: Knowing & Understanding i. Sciences Obj A - explain scientific knowledge ii. Sciences Obj A - apply scientific knowledge & understanding to solve problems set in familiar & unfamiliar situations	Self Managem ent Communi cation	

Cellular Biology	Systems	Form & Function	Identities and Relationships	The form and function of a system affects its identities and relationships.	Sciences Objective B: Inquiring & Designing i. Sciences Obj:B - explain a problem or question to be tested by a scientific investigation ii. Sciences Obj B - formulate a testable hypothesis & explain it using scientific reasoning Sciences Objective C: Processing & Evaluating ii. Sciences Obj C - interpret data & explain results using scientific reasoning iv. Sciences Obj C - evaluate the validity of the method v. Sciences Obj C - explain improvements or extensions to the method	Graphic Organizer Cornell Notes Research Thinking Cornell Notes Interactiv e Notebook Mind Mapping	• Cells use the passive and active transport of substances across membranes to maintain relatively stable intracellular environments (SC09-GR.HS-S.2-GL E.5)
Photosynthes is/Respiration	Change	Energy and Transformat ion	Scientific and technical Innovation	Scientific and technical innovation can be used to explain Changes related to energy and transformation	Sciences Objective A: Knowing & Understanding iii. Sciences Obj A - analyze & evaluate information to make scientifically supported judgments Sciences Objective D: Reflecting on the Impacts of Science i. Sciences Obj D - explain the ways in which science is applied & used to address a specific problem or issue ii. Sciences Obj D - discuss & evaluate the various implications of the use of science & its application in	Thinking skills Communi cation skills Interactiv e Notebook	• The energy for life primarily derives from the interrelated processes of photosynthesis and cellular respiration. Photosynthesis transforms the sun's light energy into the chemical energy of molecular bonds. Cellular respiration allows cells to utilize chemical energy

Nucleic Acids, Synthesis	Systems	Models and Function	Identities and Relationships	Identities and Relationships of Nucleic Acids can be modeled to explore function in Systems.	Sciences Objective A: Knowing & Understanding i. Sciences Obj A - explain scientific knowledge iii. Sciences Obj A - analyze & evaluate information to make scientifically supported judgments Sciences Objective C: Processing & Evaluating i. Sciences Obj C - present collected & transformed data	Self-mana gement skills Cornell Notes Critical Reading	when these bonds are broken.(SC09-GR.H S-S-2-GLE.4) • Physical and behavioral characteristics of an organism are influenced to varying degrees by hereditable genes, many of which encode instructions for the production of proteins (SC09-GR.HS-S-2-GL E.7)
Fundamental Genetics	Change	Patterns and Consequenc es	Personal and Cultural Expressions	Patterns of genetic expression and change have consequences within a culture or population.	Sciences Objective A: Knowing & Understanding ii. Sciences Obj A - apply scientific knowledge & understanding to solve problems set in familiar & unfamiliar situationsSciences Objective C: Processing & Evaluating iv. Sciences Obj C – eval the validity of the method v. Sciences Obj C – explain improvements or exten to the method	Research Skills Cornell Notes Interactiv e Notebook Critcal Reading	Multicellularity makes possible a division of labor at the cellular level through the expression of select genes, but not the entire genome (SC09-GR.HS-S-2-GL E.8)
Bioengineeri ng and Bioethics	Relations hips	Consequenc es and Transformat ion	Fairness and Development	The transformation of biological relationships has global consequences for fairness and development	Sciences Objective D: Reflecting on the Impacts of Science i. Sciences Obj D - explain the ways in which science is applied & used to address a specific problem or issue	Research Skills Critical Reading Graphic Organizer	

					ii. Sciences Obj D - discuss & evaluate the various implications of the use of science & its application in solving a specific problem or issue iii. Sciences Obj D - apply communication modes effectively iv. Sciences Obj D - document the work of others & sources of information used		
Evolution	Change	Evidence and Patterns	Orientation in Time and Space	Evolutionary change is evidenced in patterns oriented in time and space.	Sciences Objective B: Inquiring & Designing i. Sciences Obj:B - explain a problem or question to be tested by a scientific investigation ii. Sciences Obj B - formulate a testable hypothesis & explain it using scientific reasoning Sciences Objective C: Processing & Evaluating iii. Sciences Obj C - evaluate the validity of a hypothesis based on the outcome of the scientific investigation iv. Sciences Obj C - evaluate the validity of the method	research skills	Evolution occurs as the hereditable characteristics of populations change across generations and can lead populations to become better adapted to their environment (SC09-GR.HS-S-2-GL E.9)

Unit title	Time (Wks)	Key concept	Related concept s	Global context	Statement of inquiry	MYP Subject group objective(s)	ATL skills & AVID strategies	Content (topics, knowledge, skills)
Lab Safety, Scientific Method, and Measure ment	5	Relation ships	Function , Patterns	Identities and Relation-s hips	The patterns and functions of the metric system describe the relationship between measurements and physical quantities.	B: Inquiring and designing i. explain a problem or question to be tested by a scientific investigation ii. formulate a testable hypothesis and explain it using scientific reasoning iii. explain how to manipulate the variables, and explain how data will be collected iv. design scientific investigations C: Processing and evaluating ii. interpret data and explain results using scientific reasoning v. explain improvements or extensions to the method D: Reflecting on the impacts of science i. explain the ways in which science is applied and used to address a specific problem or issue	I. Communication skills Reading, writing and using language to gather and communicate information Use and interpret a range of discipline-specific terms and symbols Take effective notes in class X. Transfer skills Utilizing skills and knowledge in multiple contexts Apply skills and knowledge in unfamiliar situations	Students know and can use: - metric system - scientific method - analysis and presentation of data
Matter and Atomic Theory	8	Relation ships	Evidenc e and Transfor mation	Scientific and technical innovation	Development of the atomic theory lead to the relationships between the properties of matter and the structure of the atom.	A: Knowing and understanding i. explain scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. analyse and evaluate information to make	I. Communication skills Reading, writing and using language to gather and communicate information Understand and use mathematical notation Take effective notes in class	I. Introduction to Matter II. Mixtures vs. Pure Substances III. Homogeneous vs. Heterogeneous IV. Element vs. Compound V. Chemical and Physical Properties VI. Chemical and Physical Changes

7						scientifically supported judgments D: Reflecting on the impacts of science iii. apply scientific language effectively iv. document the work of others and sources of information used		VII. "Molecules that Changed the World" VIII. Atomic Theory IX. Electrons, Protons, and Neutrons
Physics- Motion and Forces	11	Systems	Conseq uences and Patterns	Scientific and technical innovation	Patterns shown by systems are a consequence of the forces applied to them.	A: Knowing and understanding i. explain scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. analyse and evaluate information to make scientifically supported judgments B: Inquiring and designing i. explain a problem or question to be tested by a scientific investigation C: Processing and evaluating ii. interpret data and explain results using scientific reasoning	I. Communication skills Reading, writing and using language to gather and communicate information Make inferences and draw conclusions II. Collaboration skills Working effectively with others Listen actively to other perspectives and ideas VI. Information literacy skills Finding, interpreting, judging and creating information Collect, record and verify data	Motion speed, distance and time acceleration Newton's Laws inertia force vs. acceleration action and reaction Students will: - model Newton's Laws - design experiments to test motion and forces - design and use simple machines
Exploring Earth	12	Change	Interac- tion and Models	Globalizat ion and Sustainab ility	Change is a result of interactions in the environment and can be modeled for understanding.	A: Knowing and understanding i. explain scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. analyse and evaluate information to make	III. Organization skills Managing time and tasks effectively Plan short- and long-term assignments; meet deadlines Plan strategies and take action to achieve personal and academic goals	Students will: - describe plate tectonics - differentiate between the hole in the ozone layer and global warming - discuss the impacts of enhanced global warming distinguish between weather

	scientifically supported judgments C: Processing and evaluating ii. interpret data and explain results using scientific reasoning v. explain improvements or extensions to the method D: Reflecting on the impacts of science i. explain the ways in which science is applied and used to address a specific problem or issue ii. discuss and evaluate the various implications of using science and its application to solve a specific problem or issue iii. apply scientific language effectively iv. document the work of others and sources of information used	and climate Students can: - explain the connection between plate tectonics and volcanoes and earthquakes - draw a weather map
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2019-2020 MYP Subject Overview

Teacher(s): Derr

Unit title	Weeks	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP Subject group objective(s)	ATL skills & AVID strategies	Content (topics, knowledge, skills)
Essentials of Chemistry, Tools, and Matter	6	Relationships are the connections and associations between properties, objects, people and ideas-including the human community's connections with the world in which we live. Any change in relationship brings consequences-some of which may occur on a small scale, while others may be far reaching, affecting large networks and systems like human societies and the planetary ecosystem.	Function Form Patterns	Scientific and Technical Innovation	The evolution of the relationships of form, function or pattern leads to progress in technical utility.	A: Knowing and understanding iii, analyze and evaluate information to make scientifically supported judgments B: Inquiring and designing iii. explain how to manipulate the variables, and explain how data will be collected iv. design scientific investigations C: Processing and evaluating ii. interpret data and explain results using scientific reasoning D: Reflecting on the impacts of science iii. apply scientific language effectively	Self Management: III. Organization skills Managing time and tasks effectively Keep and use a weekly planner for assignments Communication skills Reading, writing and using language to gather and communicate information Read critically and for comprehension Make inferences and draw conclusions	SCO9-GR.HS-S.1-GLE.2 Prepared graduates apply an understanding of atomic and molecular structure to explain the properties of matter GLE.2 Matter has definite structure that determines characteristic physical and chemical properties. Content Students will know: 1. Chemical and physical properties of matter 2. Difference between atom, molecule, element, compound, mixture Skills Students can 1. Design labs to gather, analyse and interpret data on chemical and physical properties of matter 2. Develop models of matter Students will know: 1. Chemical and physical properties of matter 2. Difference between atom, molecule, element, compound, mixture Skills Students can: 1. Design labs to gather, analyse and interpret data on chemical and physical properties of matter 2. Develop models of matter 2. Develop models of matter

The Atom and The Periodic Table	6	Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.	Evidence Models Patterns	Orientation in Space and Time	Evidence for systems of understanding such as scientific models derive from patterns and observations recorded over long periods of time.	A: Knowing and understanding i. explain scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations C: Processing and evaluating iii. evaluate the validity of a hypothesis based on the outcome of the scientific investigation iv. evaluate the validity of the method	Self Management IV. Affective skills Managing state of mind Perseverance V Demonstrate persistence and perseverance Practise delaying gratification Research VI. Information literacy skills Finding, interpreting, judging and creating information Collect, record and verify data Collect and analyse data to identify solutions and make informed decisions Process data and report results	Prepared graduates apply an understanding of atomic and molecular structure to explain properties of matter (SCO9-GR.HS-S-GLE.2) - Matter has definite structure that determines characteristic physical and chemical properties. students will know: - SUBATOMIC PARTICLES AND THEIR CHARACTERISTICS THAT DETERMINE ATOMIC PROPERTIES - element's position on the periodic table and how it indicates properties - groups of elements on the table Skills: - determine numbers of subatomic particles in atoms and compounds - predict properties of matter based on periodic table position - determine % composition
Chemical Bonding	6	Change is a conversion, transformation, or movement from one form, state or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	Energy Interaction	Scientific and Technical Innovation	Scientists can manipulate energy and chemical interactions to change molecules into products that are useful in the progress of human health and industry.	A: Knowing and understanding i. explain scientific knowledge ii. apply scientific knowledge and understanding to solve problems	Thinking IX. Creative thinking skills Generating novel ideas and considering new perspectives	SC09-GR.HS-S.1-GLE.2 Prepared graduates apply an understanding of atomic and molecular structure to explain the properties of matter GLE.2 Matter has definite structure that determines characteristic physical and chemical properties. Content Students will know: 1. Chemical and

						set in familiar and unfamiliar situations iii. analyse and evaluate information to make scientifically supported judgments D: Reflecting on the impacts of science i. explain the ways in which science is applied and used to address a specific problem or issue ii. discuss and evaluate the various implications of using science and its application to solve a specific problem or issue iii. apply scientific language effectively iv. document the work of others and sources of information used	Make guesses, ask "what if" questions and generate testable hypotheses X. Transfer skills Utilizing skills and knowledge in multiple contexts Utilize effective learning strategies in subject groups and disciplines Transfer current knowledge to learning of new technologies	physical properties of matter 2. Difference between atom, molecule, element, compound, mixture Skills Students can: 1. Design labs to gather, analyse and interpret data on chemical and physical properties of matter 2. Develop models of matter.
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Molecular Mixing	6	Relationships are the connections and associations between properties, objects, people and ideas-including the human community's connections with the world in which we live. Any change in relationship brings consequences-some of which may occur on a small scale, while others may be far reaching, affecting large networks and systems like human societies and the planetary ecosystem.	Form Interaction	Scientific and Technical Innovation	Relationships among elements determine interactions and the form of products.	B: Inquiring and designing i. explain a problem or question to be tested by a scientific investigation ii. formulate a testable hypothesis and explain it using scientific reasoning iii. explain how to manipulate the variables, and explain how data will be collected iv. design scientific investigatins C: Processing and evaluating i. present collected and transformed data ii. interpret data and explain results using scientific	Self Management V. Reflection skills (Re-)considering the process of learning; choosing and using ATL skills Identify strengths and weaknesses of personal learning strategies (self- assessment)	SCO9-GR.HS-S.1-GLE.2 Prepared graduates apply an understanding of atomic and molecular structure to explain the properties of matter and predict outcomes of chemical reactions. GLE.3 a. Students can analyse and balance equations. b. predict reactants and products. Nature of: share experimental data and respectfully discuss conflicting results. Students will know: Reactions can be represented by equations Reactions involve energy The specific impacts of acids and bases in reactions Skills: Students can: Balance equations Differentiate between acids and bases
						and explain results using		

						hypothesis based on the outcome of the scientific investigation iv. evaluate the validity of the method v. explain improvements or extensions to the method		
Organic Chemistry	6	Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.	Consequences, Function	Identities and Relationships	There are many implications and consequences for human societies both because they are carbon based systems and because of their development and use of other carbon based compounds.	i. explain scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. analyse and evaluate information to make scientifically supported judgments D: Reflecting on the impacts of science i explain the ways in which science is	Research VII. Media literacy skills Interacting with media to use and create ideas and information Locate, organize, analyse, evaluate, synthesise and ethically use information from a variety of sources and media (including digital social media and online networks) Thinking IX. Creative thinking skills Generating novel ideas and considering new perspectives Use brainstorming and visual diagrams to generate new ideas and inquiries	CO Science Standard 4: Atoms bond in different ways to form molecules and compounds that have definite properties. Carbon atoms bond in ways that provide the foundation for a wide range of applications. Living systems create and use chemical compounds. Content: Students will know: The structure and function of organic compounds The classification of biomolecules The metabolism of organic molecules in the human body Skills: Students can: Model organic compounds and reactions Differentiate between the structures and functions of organic compounds Analyze their own diet

Resources	6	Change is a conversion, transformation, or	Environment, Transformation	Globalization	Changes in resource	applied and used to address a specific problem or issue ii. discuss and evaluate the various implications of using science and its application to solve a specific problem or issue iii. apply scientific language effectively iv. document the work of others and sources of information used B: Inquiring and	Thinking VIII. Critical	GLE 3: Matter can change form through chemical or
		movement from one form, state or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.		Sustainability	utilization affects the environment and transforms global politics	i. explain a problem or question to be tested by a scientific investigation ii. formulate a testable hypothesis and explain it using scientific reasoning iii. explain how to manipulate the variables, and	thinking skills Analysing and evaluating issues and ideas Identify trends and forecast possibilities Self Management IV. Affective skills Managing state of mind Self-motivation • Practise analysing and attributing causes for failure • Practise managing self-talk • Practise positive thinking	nuclear reactions abiding by the laws of conservation of mass and energy. b. Predict reactants and products for different types of chemical and nuclear reactions. d. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate the conservation of mass and energy.

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			i. explain the ways		
			in which science is		
			applied and used		
			to address a		
			specific problem		
			or issue	п п	
			ii. discuss and		
			evaluate the		
			various		
			implications of		
			implications of		
			using science and		
			its application to		
			solve a specific		
			problem or issue		
			iii. apply scientific		
			language		
			effectively		
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			iv. document the		
			work of others		
			and sources of		
			information used		
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2019-2020 MYP Subject Overview Honors Chemistry Teacher(s): Sojka

Unit title	Time (Wks)	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP Subject group objective(s)	ATL skills & AVID strategies	Content (topics, knowledge,
						objective(s)	strategies	skills)

Honors 4 Chemistry Atomic Theory		Evidence, Models	Fairness and development	Change is a conversion, transformation, or movement from one form, state or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	 A: Knowing and understanding B: Inquiring and designing C: Processing and evaluating D: Reflecting on the impacts of science 	Finding, interpreting, judging and creating information	
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Honors Chemistry- Moles, Nomenclature, Balancing, Stoichiometry	6 week	Students will understand- Relationships to moles, grams, and numbers of molecules Understand the law of conservation of mass and how it relates to balance chemical equations Find the relationship between grams, moles, and molecules in a balanced chemical equations Write names and formulas of compounds	Balance, Interaction	Identities and relationships	Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.	•	A: Knowing and understanding B: Inquiring and designing C: Processing and evaluating D: Reflecting on the impacts of science	Information literacy skills Finding, interpreting, judging and creating information Analysing and evaluating issues and ideas	
Honors Chemistry Electronic Structure of the Atom	4 Week	Learning experiences Nature of Light Quantum Mechanics Electron Configuration Orbital Diagrams Periodic Trends	Consequences, Interaction	Scientific and technical innovation	Change is a conversion, transformation, or movement from one form, state or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	•	A: Knowing and understanding B: Inquiring and designing D: Reflecting on the impacts of science	Information literacy skills Finding, interpreting, judging and creating information Analysing and evaluating issues and ideas	Time (Wks)