MCS Biology Subject Group Overview SY 25 - 26

Unit Name		**Ecology:** Stability and Change in Ecosystems	**Evolution:** Forces of Microevolution, Patterns of Macroevolution, and Classification	**Cellular Reproduction:** The Cell Cycle, Mitosis, and Meiosis	**Molecular Genetics:** The Central Dogma of Biology	**Patterns of Heredity:** Mendelian and Non-Mendelian Genetics: Patterns of Heredity	**Cellular Biology:** Structure & Function in Living Systems	**Energy Transfer:** Energy Transfer through Cells	**Milestone Review** & Post EOC Exploration
Unit Number		**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**	**Unit 7**	**Unit 8**
Semester		**Semester 1**				**Semester 2**			
Subunits		Flow of Energy and Matter in Ecosystems Biogeochemical Cycles Community Ecology Human Impact and Global Ecological Concerns	Forces of Microevolution Evidence of Evolution Patterns of Macroevolution & Speciation Endosymbiosis Classification and Phylogeny	Mitosis and Asexual Reproduction Cancer Meiosis and Sexual Reproduction Advantages & Disadvantages of Sexual and Asexual Reproduction Chromosomal Abnormalities	Structure and Function of DNA and RNA DNA Replication Protein Synthesis Types of DNA Mutations Uses and Ethical Considerations of Biotechnology	Mendel's Laws of Heredity Punnett Squares Non-Mendelian Patterns of Inheritance Pedigree Analysis	Biochemistry Cell Structure & Function Endosymbiosis Cellular Transport Viruses	Photosynthesis ATP Cycle Cellular Respiration Flow of Energy and Matter in Cells and Ecosystems	Most Missed CFA/CSA Questions (Openers & Closers) EOC Unit Study Guides 1-5 and EOC Practice Tests Units 1-4 SEP/CCC Explorations
Time Frame		4 weeks 10 days	4.5 weeks 11 days	4 weeks 10 days	3.5 weeks 9 days	3.5 weeks 9 days	4 weeks 10 days	2.5 weeks 6 days	6 weeks 15 days
Course Name: **B I O L O G**	**GSE Standards**	SB5a, b, c, d, e	SB6a, b, c, d, e SB4a, b	SB1b SB2a (partial) SB2b SB3a, c	SB2a, c SB2b *(partial)*	SB3a, b	SB1a, c, d SB4a *(partial)*, c	SB1e SB5b	Georgia Standards of Excellence for Biology
	Science & Engineering Practices	Planning & Carrying Out Investigations Developing & Using Models Engaging in	Constructing Explanations Analyzing & Interpreting Data Engaging in Argument from	Developing & Using Models Engaging in Argument from Evidence Constructing	Constructing Explanations Engaging in Argument from Evidence Asking Questions	Asking Questions Using Mathematics & Computational Thinking Developing &	Constructing Explanations Engaging in Argument from Evidence Planning &	Asking Questions Constructing Explanations Develop and Use Models	NGSS Science & Engineering Practices

Published: 8,2025 Resources, materials, assessments not linked to SGO or unit planner will be reviewed at the local school level.

MCS Biology Subject Group Overview SY 25 - 26

Y		Argument from Evidence Designing Solutions Constructing Explanations	Evidence Using Mathematics & Computational Thinking Developing & Using Models	Explanations		Using Models	Carrying Out Investigations		
	Crosscutting Concepts	Cause & Effect Energy & Matter Stability & Change	Patterns Structure & Function System & System Models	Stability & Change Structure & function System & System Models	Structure & Function Cause & Effect System & System Models	Patterns Cause and Effect System & System Models	Structure & Function System & System Models Stability & Change	Energy & Matter Structure and Function Systems and System Models	NGSS Crosscutting Concepts
Course Name: **B I O L O G Y**	**Disciplinary Core Ideas**	Food chains & food webs Cycles of matter Energy pyramids Succession Foundational & keystone species Competition Predator and prey relationships Growth curves and limiting factors Human impact on ecosystems	Forces of microevolution (mutation, natural selection, genetic drift (founder & bottleneck), gene flow, and sexual selection Evidence of evolution (new understandings of Earth's history, emergence of new species, biogeography, the fossil record, and modern evidence of evolution (resistance, moths, etc.) comparative anatomy & embryology Patterns of macroevolution and speciation (barriers to gene flow, mass extinctions,	Asexual Reproduction(binary fission, mitosis) The cell cycle and cancer Genetic continuity Sexual reproduction (meiosis) Karyotype analysis Heritable variation (crossing over and fertilization) Advantages and disadvantages of asexual reproduction Advantages and disadvantages of sexual reproduction	DNA structure and function RNA structure and function DNA replication (continuity) Protein synthesis (transcription and translation) DNA Mutations (insertion, deletion, substitution) Causes of mutations-radiation, chemicals and viruses Ethical considerations of biotechnology	Mendel's law of dominance Mendel's law of segregation Mendel's law of independent assortment Calculating expected genotype and phenotype ratios from completed Punnett squares Determining patterns of inheritance using pedigree analysis Codominance Incomplete dominance Sex-linked inheritance Calculating expected	CHONPS Organic and Inorganic Structure & function of carbohydrates, lipids, proteins, and nucleic acids Cell Organelles function in maintaining homeostasis Endosymbiosis Passive & Active Transport	ATP/ADP Cycle Aerobic Respiration (glycolysis, Krebs, electron transport chain) Anaerobic Respiration Photosynthesis light reactions Photosynthesis dark reactions	Georgia Standards of Excellence for Biology NGSS Science & Engineering Practices NGSS Crosscutting Concepts

MCS Biology Subject Group Overview SY 25 - 26

			adaptive radiation, convergent evolution, coevolution, divergent evolution, gradualism, and punctuated equilibrium) Comparison of 3 domains Endosymbiosis Comparison of 5 kingdoms Cladograms & phylogenetic trees			genotype and phenotype ratios from completed non-Mendelian Punnett squares			
Course Name: **B I O L O G Y**	**Approaches to Learning & Instructional Strategies** **Unit Phenomenon and Year long Phenomenon**	**ATLs:** Communication Skills: *Find information for disciplinary and interdisciplinary inquiries, using a variety of media* Research Skills: *Access information to be informed and inform others* **Unit Phenomenon:** Algae Blooms and Human impacts on ecosystems **Year long Phenomenon:** Sickle Cell Anemia	**ATLs:** Thinking Skills *Draw reasonable conclusions* *Use models and simulations to explore complex systems and issues* Social Skills *Exercise leadership and take on a variety of roles in a group* *Work collaboratively in groups* **Unit Phenomenon:** Antibiotic Resistance **Year long Phenomenon:** Sickle Cell Anemia	**ATLs:** Communication Skills: *Give and receive meaningful feedback* Social skills: *Give and receive meaningful feedback* **Unit Phenomenon:** Cancer **Year long Phenomenon:** Sickle Cell Anemia	**ATLs:** Communication Skills: *Use a variety of speaking techniques to communicate with a variety of audiences; Read a variety of sources for information; organize an depict information logically* Social Skills: Listen actively to other perspectives and ideas; Encourage others to contribute Research Skills: Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of	**ATLs:** Thinking Skills: *interpret data* Communication Skills: *Use a variety of organizers for academic writing tasks* **Unit Phenomenon:** : Non-identical Twins **Year long Phenomenon:** Sickle Cell Anemia	**ATLs:** Thinking Skills *Practice observing carefully in order to recognize problems* *Evaluate evidence and arguments* Communication Skills *Negotiate ideas and knowledge with peers and teacher* *Use appropriate forms of writing for different purposes* **Unit Phenomenon:** Saltwater fish homeostatic adaptations **Year long**	**ATLs:** Thinking Skills: *Make unexpected or unusual connections between objects and/or ideas* Communication Skills: *Organize and depict information logically* **Unit Phenomenon:** Aquarium Plants and Animals Mitochondrial Diseases **Year long Phenomenon:** Sickle Cell Anemia	**ATLs:** Thinking Skills *Revise understanding based on new information and evidence* Communication Skills: *organizing and depicting information logically; paraphrase accurately and precisely* Research Skills *Use memory techniques to develop long-term memory* Self-management Skills: *plan strategies and take action to achieve personal and academic*

MCS Biology Subject Group Overview SY 25 - 26

					sources and media **Unit Phenomenon:** Cellular differentiation **Year long Phenomenon:** Sickle Cell Anemia		**Phenomenon:** Sickle Cell Anemia		*goals* Social Skills: *Give and receive meaningful feedback* **Unit Phenomenon:** **Year long Phenomenon:** Sickle Cell Anemia
Course Name: **B I O L O G Y**	**Statement of Inquiry**	Human interaction within systems can impact relationships and have consequences and affect the sustainability of the planet.	Discerning changes in patterns and using evidence to construct systems with rules and conventions can help to explain how the world works. Understanding relationships among the organisms based on their forms and patterns that can lead to classification based on identities.	Models help people visualize the relationship between the structures and functions that shape identity.	Your identity and relationships with other people are determined by genetic factors: scientific evidence has led to models that help to understand observed patterns of inheritance.	Models help people visualize and predict the relationship within patterns that shape human identity.	Identity is determined by the relationship between different levels of cellular organization in your body which, although differing in complexity, share patterns and functions with all life on Earth.	The systems of life are supported by biochemical reactions and the transformations of energy that occur within cells.	Pioneering discoveries can challenge conventional wisdom and open pathways toward deeper understanding. Scientists discern patterns and use them to construct systems with rules and conventions that help to explain how the world works. Societies must consider the consequences of change made possible by the biological revolution's technological innovations.
	Global Context	Globalization and Sustainability Identities and Relationships	Identities and Relationships	Identities and relationships	Scientific and Technical Innovation	Identities & Relationships	Identities and Relationships	Identities and Relationships	MYP Global Contexts
	Key Concepts	Causation	Change	Causation	Form	Form	Connection	Connections	MYP Key Concepts for

MCS Biology Subject Group Overview SY 25 - 26

									Science
	Related Concepts	Interdependence Relationships	Adaptation Relationships	Growth Cycles	Patterns Systems	Patterns Transformation	Homeostasis Interdependence	Systems Cycle	MYP Related Concepts for Science
	MYP Assessments & Performance Tasks	***Objective A:*** *Knowing and Understanding* **ii.** Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ***Objective D:*** *Reflecting on the Impact of Science:* **iv.** document the work of others and sources of information used ***Objective B:*** *Inquiring and Designing* iii. explain how to manipulate the variables, and explain how data will be collected Experimental Design Lab 2 Common Formative Assessments C-E-R 1 Writing Task Common Summative Assessment	***Objective C:*** *Processing and Evaluating:* **ii.** interpret data and explain results using scientific reasoning 1 Common Formative Assessment 1 MYP writing task 1 Common Summative Assessment	***Objective A:*** *Knowing and Understanding* **ii.** interpret data and explain results using scientific Reasoning 1 Common Formative Assessment or MYP Writing 1 Common Summative Assessment or MYP Writing Task	***Objective D:*** *Reflecting on the impact of science* **ii:** interpret data and explain results using scientific reasoning 1 Common Formative Assessment 1 Common Summative Assessment 1 MYP writing task	***Objective D:*** *Reflecting on the impact of science* **iii:** apply scientific language effectively ***Objective C:*** *Processing and Evaluating:* **iv:** evaluate the validity of the method 2 Common Formative Assessments 2 MYP Writing Task Common Summative Assessment	***Objective B:*** *Inquiring and Designing* **ii.** formulate a testable hypothesis and explain it using scientific reasoning Experimental Design Lab 1 Common Formative Assessment 1 MYP - Global approach Common Summative Assessment	***Objective D:*** *Reflecting on the impact of science* **iii:** apply scientific language effectively 1 MYP Writing Task Common Summative Assessment	Units 1-4 EOC Practice Assessments
Differentiated for Tiered Learners		Marietta City Schools teachers provide specific differentiation of learning experiences for all students. Details for differentiation for learning experiences are included on the district unit planners.							

MCS Biology Subject Group Overview SY 25 - 26

Course Levels	Marietta City Schools offers Honors and IB classes to provide differentiated learning experiences for students.