

MCS Biology Subject Group Overview SY 24-25

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	Cellular Biology: Structure & Function in Living Systems	Energy Transfer: Pathway of Energy 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	Forces of Microevolution	Mitosis and Asexual Reproduction	Structure and Function of DNA and RNA	Mendel's Laws of Heredity	Biochemistry	Photosynthesis	Most Missed CFA/CSA Questions (Openers & Closers)
		Biogeochemical Cycles	Evidence of Evolution	Cancer	DNA Replication	Punnett Squares	Cell Structure & Function	ATP Cycle	
Subunits		Community Ecology	Patterns of Macroevolution & Speciation	Meiosis and Sexual Reproduction	Protein Synthesis	Non-Mendelian Patterns of Inheritance	Endosymbiosis	Cellular Respiration	EOC Unit Study Guides 1-5 and EOC Practice Tests Units 1-4
		Human Impact and Global Ecological Concerns	Endosymbiosis	Advantages & Disadvantages of Sexual and Asexual Reproduction	Types of DNA Mutations	Pedigree Analysis	Cellular Transport	Flow of Energy and Matter in Cells and Ecosystems	
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 SB5b (partial)	SB6a, b, c, d, e SB4a (partial), b SB3c (partial)	SB1b SB2b (partial) SB3c (partial)	SB2a, c SB2b (partial)	SB3a, b	SB1a, c, d SB4a (partial), c	SB1e SB5b (partial)	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	Engaging in Argument from Evidence Developing & Using Models Constructing	Constructing Explanations Asking Questions Engaging in Argument from Evidence	Asking Questions Using Mathematics & Computational Thinking Developing & Using Models	Constructing Explanations Engaging in Argument from Evidence Planning &	Asking Questions Constructing Explanations	NGSS Science & Engineering Practices

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Y		Argument from Evidence Designing Solutions Constructing Explanations	Evidence Using Mathematics & Computational Thinking Developing & Using Models	Explanations			Carrying Out Investigations		
	Crosscutting Concepts	Scale, Proportion, & Quantity Cause & Effect Energy & Matter Stability & Change	Patterns Cause & Effect Structure & Function System & System Models Stability & Change	Stability & Change Cause & Effect System & System Models	Structure & Function Cause & Effect	Patterns Scale, Proportion, & Quantity System & System Models	Structure & Function System & System Models Cause & Effect Patterns Stability & Change	Energy & Matter	NGSS Crosscutting Concepts
	Disciplinary Core Ideas	Food chains & food webs Energy pyramids Cycles of matter Succession Foundational & keystone species Predator and prey growth curves Limiting factors Pollution and acid rain Carbon emissions & global warming Biomagnification & algae blooms Invasive species Loss of biodiversity	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	Events of the cell cycle Mitosis & Cytokinesis Asexual Reproduction / Binary Fission Cancer Benefits of sexual reproduction Meiosis I and II Crossing over / variation and continuity Nondisjunction and chromosomal abnormalities	Structure and function of DNA and RNA DNA replication (continuity) Protein synthesis (central dogma) DNA Mutations Techniques used to manipulate DNA Ethical considerations of Biotechnology and Genetic Engineering	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	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

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<p>Course Name:</p> <p style="font-size: 2em; letter-spacing: 0.5em;">B I O L O G Y</p>			<p>extinctions, adaptive radiation, convergent evolution, coevolution, divergent evolution, gradualism, and punctuated equilibrium)</p> <p>Comparison of 3 domains</p> <p>Endosymbiosis</p> <p>Comparison of 5 kingdoms</p> <p>Cladograms & phylogenetic trees</p>			<p>Calculating expected genotype and phenotype ratios from completed non-Mendelian Punnett squares</p>			
	<p>Approaches to Learning & Instructional Strategies</p> <p>Anchoring Phenomenon</p>	<p>Thinking Skills Social Skills Communication Skills Self-Management Skills Research Skills</p> <p>Anchoring Phenomenon: Algae Blooms Sickle Cell Anemia</p>	<p>Thinking Skills Communication Skills</p> <p>Anchoring Phenomenon: Sickle Cell Anemia Antibiotic Resistance</p>	<p>Thinking Skills Communication Skills</p> <p>Anchoring Phenomenon: Cancer Non-Identical Twins Sickle Cell Anemia</p>	<p>Thinking Skills Communication Skills Research Skills</p> <p>Anchoring Phenomenon: Sickle Cell Anemia</p>	<p>Thinking Skills Communication Skills</p> <p>Anchoring Phenomenon: Roan Cows Sickle Cell Anemia</p>	<p>Thinking Skills Social Skills Communication Skills Self-Management Skills</p> <p>Anchoring Phenomenon: Sickle Cell Anemia</p>	<p>Thinking Skills Communication Skills</p> <p>Anchoring Phenomenon: Slug Power Sickle Cell Anemia</p>	<p>Thinking Skills Communication Skills Research Skills Self-management Skills Social Skills</p> <p>Anchoring Phenomena for NGSS</p> <p>Sickle Cell Anemia</p>
	<p>Statement of Inquiry</p>	<p>Human interaction within systems can impact relationships and have consequences and affect the sustainability of the planet.</p>	<p>Discerning changes in patterns and using evidence to construct systems with rules and conventions can help to explain how the world works.</p>	<p>Models help people visualize the relationship between the structures and functions that shape identity.</p>	<p>Societies must consider the consequences of change made possible by the biological revolution's technological innovations.</p>	<p>Models help people visualize and predict the relationship within patterns that shape human identity.</p>	<p>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.</p>	<p>The systems of life are supported by biochemical reactions and the transformations of energy that occur within cells.</p>	<p>Pioneering discoveries can challenge conventional wisdom and open pathways toward deeper understanding.</p> <p>Scientists discern patterns and use them to construct systems with rules and</p>

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Course Name: B I O L O G Y									<p>conventions that help to explain how the world works.</p> <p>Societies must consider the consequences of change made possible by the biological revolution's technological innovations.</p>
	Global Context	Globalization and Sustainability Scientific & Technological Innovation	Globalization & Sustainability	Identities & Relationships	Scientific and Technical Innovation	Identities & Relationships	Identities and Relationships	Scientific and Technical Innovation	MYP Global Contexts
	Key Concepts	Change Communities Connections Culture Global Interactions Perspective Relationships Systems	Change Communities Connections Global Interactions Identity Systems	Relationships Development Identity	Relationships Development Identity Change Form	Relationships Development Identity	Relationships Form Connections Systems	Connections Systems	MYP Key Concepts for Science
	Related Concepts	Balance Consequences Energy Environment Interaction Movement Transformation	Environment Evidence Models Patterns	Models	Consequences Evidence Form Function Models Patterns	Interaction Models Patterns	Balance Environment Form Function Interaction Models Movement	Balance Energy Environment Interaction Models Transformation	MYP Related Concepts for Science
	MYP Assessments & Performance Tasks	Experimental Design Lab 2 Common Formative Assessments Keystone & Invasive Species C-E-R 1 MYP - Global approach to all	1 Common Formative Assessment 1 MYP - Global approach to all topics in unit 1 Common Summative Assessment	1 Common Formative Assessment 1 MYP - Global approach to all topics in unit 1 Common Summative Assessment	2 Common Formative Assessments 1 MYP - Global approach to all topics in unit 1 Common Summative Assessment	2 Common Formative Assessments 2 MYP - Global approach to all topics in unit 1 Common Summative Assessment	Experimental Design Lab 1 Common Formative Assessment 1 MYP - Global approach to all topics in unit 1 Common	1 MYP - Global approach to all topics in unit 2 Common Summative Assessment	Units 1-4 EOC Practice Assessments

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		topics in unit 1					Summative Assessment		
		Common Summative Assessment							
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.								
Course Levels	Marietta City Schools offers Enhanced, Honors, Accelerated, and AP classes to provide differentiated learning experiences for students.								