Biology Subject Group Overview

Unit Name		**Ecology**: Stability and Change in Ecosystems	**Evolution**: Forces of Microevolution and Patterns of Macroevolution	**The Cell Cycle:** Mitosis and Binary Fission	**Mendelian and Non Mendelian Genetics:** Patterns of Heredity	**Molecular Genetics:** Central Dogma of Biology	**Cells:** Structure and Function of Living Systems	**Cell Respiration Photosynthesis**: Energy Transfer through Cells	**Milestone Review & Post EOC Exploration**
Sub Units		Energy/Matter Flow C, O, N Cycles Community Ecology Human Impact/ Global Concerns	Microevolution Evidence & History of Life MacroEvolution Classification and Phylogeny	Mitosis and Asexual Reproduction Cancer Structure/Function of DNA/RNA	Meiosis and Sexual Chromosomal Mutations Mendel's Laws Non Mendelian Punnett Squares Pedigrees	Replication Protein Synthesis DNA Mutations Biotechnology	Macromolecules Cell Structure & Function Cell Transport	Cellular Respiration Photosynthesis	EOC Study Guides Unit 1-4 EOC Practice Tests Units 1-4 EOC Review Experiences Units 1-4 EOC Review Data/Graphical Analysis & Interpretation SEP/CCC Explorations of Biology
Time Frame		5.5 weeks	4.5 weeks	2.5 Weeks	5.5 weeks	5 Weeks	4.5 weeks	2.5 Weeks	6 weeks
Course Name: Biology	**Standards**	SB5.a,b,c,d,e	SB6.a,b,c,d,e SB4. a,b	SB1.b SB2. a SB3. c	SB1.b SB2.b SB3.a,b,c	SB1.a,b,c SB2.a,b,c	SB1.a,c,d SB4. a,c	SB1.a,e SB5.b	SB1-SB6

MCS Science Resources

Biology Subject Group Overview

	Approaches To Learning Instructional Strategies	**SEP** Plan & carry out investigations Analyze and interpret data Construct explanations Develop and use models Engage in argument from evidence Obtaining, evaluating, and communicating information **ATL** Research Skills Communication Skills	**SEP** Construct explanations & ask questions Develop and use models Engage in argument from evidence Analyze and interpret data Use mathematics and Computational Thinking Obtaining, evaluating & communicating information **ATL** Research Skills Communication Skills	**SEP** Construct explanations & ask questions Develop and use models Engage in argument from evidence Plan & carry out investigations Construct explanations & ask questions Obtaining, evaluating & communicating information **ATL** Collaboration Skills Communication Skills	**SEP** Use mathematics and computational thinking Develop and use models Engage in argument from evidence Plan & carry out investigations Analyze and interpret data Obtaining, evaluating, and communicating information **ATL** Collaboration Skills Communication Skills	**SEP** Construct explanations & ask questions Develop and use models Engage in argument from evidence Plan & carry out investigations Construct explanations & ask questions Obtaining, evaluating & communicating information **ATL** Collaboration Skills Communication Skills	**SEP** Construct explanations & ask questions Develop and use models Plan & carry out investigations Engage in argument from evidence Obtaining, evaluating & communicating information **ATL** Research Skills Communication Skills	**SEP** Construct explanations & ask questions Develop and use models Plan & carry out investigations Engage in argument from evidence Obtaining, evaluating & communicating information **ATL** Research Skills Collaboration Skills Communication Skills	**SEP** Construct explanations & ask questions Develop and use models Engage in argument from evidence Plan & carry out investigations Construct explanations & ask questions Obtaining, evaluating & communicating information **ATL** Collaboration Skills Communication Skills
	Statement of Inquiry	Modifying human activities can cause severe irreversible effects. **Phenomenon:** Human activities can cause major shifts in ecosystems.	The theory of evolution is based on the idea that all species are related and gradually change over time. **Phenomenon:** New aspects of evolution have come to light with the introduction of advanced technologies that didn't exist during Darwin's era.	Genetic continuity is maintained through necessary cellular reproduction. **Phenomenon:** Cancer exists due to a malfunction in cellular reproduction pathways.	Scientists in the field of genetics are still learning new information about how heredity works; the study of heredity occurs in laboratories all over the world. **Phenomenon:** Non-identical twin siblings do not look like each other or their parents.	Sickle cell disease is the most common inherited blood disorder, affecting 70,000 to 80,000 Americans. **Phenomenon:** Sickle cell disease is a genetic mutation that may be reversed by gene therapy.	The features that define groups of unicellular organisms have overlapped, today sophisticated techniques such as DNA sequencing are tools used by taxonomists. **Phenomenon:** Protists have always been a challenging group to classify. An amazing variety of structure &	Energy is never lost, it is conserved or transferred from one system to another system. **Phenomenon:** The interdependence of all organisms on one another is	

Biology Subject Group Overview

							function patterns are found in these aquatic organisms.	based on their environment.	
	Global Context	Globalization and Sustainability: Human Impact on the Environment	Orientation in Time and Space: Evolution, constraints and adaptation	Scientific and Technical Innovation: The Biological Revolution	Orientation in Time and Space: Evolution, constraints and adaptation	Scientific and Technical Innovation: The Biological Revolution	Scientific and Technical Innovation: The Biological Revolution	Scientific and Technical Innovation: The Biological Revolution	
	Key Concepts	Scale, Proportion & Quantity (CC) Matter & Energy (CC) Stability & Change (CC & MYP)	Transformation (MYP) Cause & Effect (CC) Patterns (CC)	Structure & Function (CC) Systems & System Models (CC & MYP) Cause & Effect (CC)	Patterns (CC) Scale, Proportion & Quantity (CC) Systems & System Models (CC & MYP)	Structure & Function (CC) Systems & System Models (CC & MYP) Cause & Effect (CC)	Structure & Function (MYP/CC) Patterns (CC) Matter & Energy (CC)	Energy & Matter (MYP/CC) Structure & Function (CC) Cause & Effect (CC)	
	Related Concepts	Environment & Interaction	Evidence, Patterns, & Models	Form & Models	Form & Models	Form & Function	Form & Function	Environmental & Interaction	
	Design Cycle Transdisciplinary	**CORE IDEAS** ● Ecosystems & Adaptations ● Human Population Growth ● Human Impact on Land Use ● Human Impact on Agriculture ● Human Impact on Ecosystems & Biodiversity ● Natural Impact on Ecosystems & Biodiversity	**CORE IDEAS** ● Mechanisms of Evolution ● Mutation ● Natural Selection ● Hardy Weinberg ● Biological/ Pesticide Resistance ● Evidence Evolution ● Fossils ● Comparative Anatomy ● Embryology ● Speciation ● Biodiversity ● Gradualism vs Punctuated Equilibrium ● Clades and Classification ● Phylogenetic Trees	**CORE IDEAS** ● Cellular reproduction (binary fission, mitosis) ● Cancer ● Asexual Reproduction	**CORE IDEAS** ● Sexual Reproduction (binary fission, mitosis, meiosis) ● Karyotypes ● Chromosomal Mutations ● Mendel's Laws ● Dihybrid Crosses ● Non-Mendelian Genetics ● Biodiversity & Patterns in Selection	**CORE IDEAS** ● Structure of DNA ● DNA replication ● Synthesizing proteins ● Gene mutations ● Biotechnology	**CORE IDEAS** ● Macromolecules ● Enzymes ● CellTheory ● Prokaryotes/ Eukaryotes ● Plant/Animal Cells ● Cell Structure ● Cell Organelles ● Cell Membrane & Transport ● Homeostasis	**CORE IDEAS** ● Food Chains/Webs ● Energy Pyramids ● Biogeochemical Cycles ● Cycling of Matter ● Human Impact ● Organelle Roles in Using and Making Energy ● Photosynthesis ● Cell Respiration	**CORE IDEAS** ● All previously covered ideas

Biology Subject Group Overview

	MYP Assessments/ Performance Tasks	Common Summative Assessments: CFA Stability and Change in Ecosystems Summative MYP: Design Lab in factors affecting biodiversity MYP: Human Impact	Common Summative Assessments CFA Stability and Change in Populations Summative MYP: Antibiotic Resistance Activity MYP: Natural Selection Lab	Common Summative Assessments MYP: Modeling Activity	Common Summative Assessments CFA Growth and Heredity Growth and Heredity Summative MYP: Mathematical Models of Inheritance Activity	Common Summative Assessments CFA DNA Structure and Replication MYP: Flow of Information Activity	Common Summative Assessments CFA Macromolecules Structure and Function of Living Systems Summative MYP: Design Lab in Cell Transport	Common Summative Assessments MYP: Photosynthesis Lab MYP: Human Impact on Cycles	Common Summative Assessments
	Differentiation 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.**							

MCS Science Resources