MCS Zoology Subject Group Overview

	Fall Semester: Unit 1-3			Spring Semester: Unit 4-6		
Unit Name	**Unit 1:** Introduction to Classification and Evolution	**Unit 2: Invertebrates Part 1:** Porifera, Cnidaria, Platyhelminthes, Nematoda, and Annelida	**Unit 3:** Semester 1 Review and Midterm	**Unit 4 : Invertebrates Part 2:** Molluscs, Arthropoda, and Echinodermata	**Unit 5: Vertebrates:** Chordata	**Unit 6:** Biodiversity and Conservation Project and Final Exam
Time Frame	8 weeks	8 weeks	2 weeks	6.5 weeks	8.5 weeks	3 weeks
Standards	SZ1a: Construct an explanation of the relationships among animal taxa using evidence from morphology, embryology, and biochemistry. SZ1c: Develop a model using data to place taxa in a phylogenetic context to support hypotheses of relationships SZ2a: Construct an explanation of the geological history of Earth and the effects of major environmental changes SZ2b: Construct an explanation of how evolution allows species to adapt to	SZ1b: Analyze and interpret data to explain patterns in structure and function and construct a classification of representative animal taxa SZ3a: Plan and carry out investigations to determine patterns in morphology SZ3b: Construct an explanation of life functions at appropriate level of organization for representative taxa SZ3c: Construct an explanation based on evidence to relate important structural changes across evolutionary history to key functional transitions. SZ4a: Construct explanations to relate structure and function of animals to ecological roles, including morphological, physiological, and behavioral adaptations SZ4b: Develop a model to explain patterns in various life cycles found among animals	SZ1a: Construct an explanation of the relationships among animal taxa using evidence from morphology, embryology, and biochemistry. SZ1b: Analyze and interpret data to explain patterns in structure and function and construct a classification of representative animal taxa SZ1c: Develop a model using data to place taxa in a phylogenetic context to	SZ1b: Analyze and interpret data to explain patterns in structure and function and construct a classification of representative animal taxa SZ3a: Plan and carry out investigations to determine patterns in morphology SZ3b: Construct an explanation of life functions at appropriate level of organization for representative taxa. SZ3c: Construct an explanation based on evidence to relate important structural changes across evolutionary history to key functional transitions. SZ4a: Construct explanations to relate	SZ1b: Analyze and interpret data to explain patterns in structure and function and construct a classification of representative animal taxa SZ3a: Plan and carry out investigations to determine patterns in morphology SZ3b: Construct an explanation of life functions at appropriate level of organization for representative taxa SZ3c: Construct an explanation based on evidence to relate important structural changes across evolutionary history to key functional transitions.	SZ5a: Ask questions and define problems, identifying the cause and effect of human activities on the biodiversity of organisms SZ5b: Design a solution to preserve species diversity in natural and captive environments with regard to conservation, habitat restoration, breeding programs and management of genetic diversity at local and global levels. SZ5c: Construct an argument based on evidence of the short-term and long-term impacts of legal, societal,

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	environmental changes.		support hypotheses of relationships SZ4a: Construct explanations to relate structure and function of animals to ecological roles, including morphological, physiological, and behavioral adaptations	structure and function of animals to ecological roles, including morphological, physiological, and behavioral adaptations SZ4b: Develop a model to explain patterns in various life cycles found among animals	SZ4a: Construct explanations to relate structure and function of animals to ecological roles, including morphological, physiological, and behavioral adaptations SZ4b: Develop a model to explain patterns in various life cycles found among animals SZ4c: Construct an explanation based on evidence of the effects of symbiotic relationships between animals and between animals and other organisms	political, ethical, and economic decisions on animal diversity.
Year-Long Phenomena: There is a wide variety of animal diversity across the planet.						
Unit Phenomenon:	Fossils from the Cambrian have representatives of almost all animal groups identified today.	Animal variety in form and function is still a field of discovery**.**			Humans share many structures with other vertebrate classes.	Humans transport invasive species that impact local species
Statement of Inquiry .	Earth's geological history has influenced the form and function	Animal form and function within invertebrate animal phyla and across key taxa influence how animals interact with their environment.			Animal diversity is influenced by human activities.	How does human activity impact the biodiversity of life on Earth?

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	of organisms through geologic time.			
Global Context:	Orientation of Time and Space	Scientific and Technological Innovations	Scientific and Technological Innovations	Globalization and Sustainability
Key Concepts:	Connections Change Relationships Systems	Change Communication Connections Relationships Development Form Systems	Change Communication Connections Relationships Development Form Systems	Systems Relationships Communities Communication Change
Related Concepts:	Evidence Patterns Environment Consequences	Environment Interactions Transformation Patterns Movement Models Function	Environment Interactions Transformation Patterns Movement Models Function	Balance Consequences Patterns Interactions Environment
Approaches to Learning:	Communication - Presenting data Thinking -Critical thinking -Evaluate claims Research -Interconnections	Thinking Skills -Critical thinking -Examine and evaluate evidence Communication -Evaluating conclusions -Active listening Social -Collaboration -Values of diversity Self-management - Improvements, feedback, and reflection Research	Thinking Skills -Critical thinking -Examine and evaluate evidence Communication -Evaluating conclusions -Active listening Social -Collaboration -Values of diversity Self-management - Improvements,	Thinking Skills -Evaluate claims Communication -Presenting data -Active listening -Media Self-management - Punctuality Research -Research, bias and credibility -Relevance -Academic Integrity

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		-Data methods -Forming questions			feedback, and reflection Research -Data methods -Interconnections	
Science & Engineering Practice:	Develop and use Models Constructing Explanations	Developing & Using Models Constructing Explanations Plan and carry out investigations Analyze and interpret data			Developing & Using Models Constructing Explanations Plan and carry out investigations Analyze and interpret data	Asking questions Constructing explanations and designing solutions Engaging in argument from evidence
Crosscutting Concepts	Stability and Change Structure & Function Cause & Effect Patterns	Systems and Systems Model Stability and Change Scale, Proportion, and Quantity Cause and Effect Patterns			Systems and Systems Model Stability and Change Scale, Proportion, and Quantity Cause and Effect Patterns	Systems and Systems Model Stability and Change Cause and Effect Patterns
Disciplinary CORE IDEAS	Morphological traits, embryological development, and molecular evidence support evolutionary relationships.	Structure and function of each phylum Evidence of common ancestry and diversity between phyla Investigating symmetry (asymmetric vs radial vs. bilateral), presence of body cavities, segmentation, and	Structure and function of each phylum Use comparative morphology, embryonic	Structure and function of each phylum Evidence of common ancestry and diversity between phyla Investigate symmetry, segmentation,	Classification based on vertebral column, limb structure, heart chambers, and reproductive strategies. Differentiating taxa	Biodiversity ensures ecosystem resilience; disturbances (e.g., deforestation, pollution) can collapse ecosystems. Humans depend on biodiversity for

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	Genetic similarities across species provide biochemical evidence of shared ancestry. Comparative anatomy shows functional adaptations and divergence from common ancestors. Constructing and interpreting phylogenetic trees using morphology, molecular data, and shared traits to visualize evolutionary relationships. Explaining how mass extinctions, continental drift, or climate change led to adaptive radiations or extinction events in animal taxa. Explaining how camouflage, or physiological adaptations, are evidence of an	cephalization across the five phyla. Life functions such as digestion, circulation, respiration, and reproduction occur at organ/system levels. Life functions change through development and complexity. Transition from radial to bilateral symmetry Development of a body cavity Segmentation in Annelida is a precursor to more complex body plans. Traits influence ecological roles. Life cycles vary widely but follow patterns related to reproduction and development.	development patterns, and molecular data to explain evolutionary relationships. Use molecular and morphological evidence to support cladograms or phylogenetic trees. Explain how structural features like body shape, feeding strategies, and sensory structures relate to each group's niche.	appendage specialization, and body plan evolution. Compare open vs. closed circulatory systems, shell presence, and type of exoskeleton. Physical adaptations tied to function Life functions such as digestion, circulation, respiration, and reproduction occur at organ/system levels. Life functions change through development and complexity. Traits influence ecological roles. Life cycles vary widely but follow patterns related to reproduction and development.	based on skeletal, integumentary, and respiratory structures Study of limb structures and integument (scales, feathers, fur) Morphological comparisons such as lung complexity, bone density, and teeth differentiation. Structure and function of each class Physical adaptations tied to function Life functions such as digestion, circulation, respiration, and reproduction occur at organ/system levels. Life functions change through development and complexity. Traits influence ecological roles.	ecosystem services; human actions can threaten biodiversity. Changes in land use, emissions, and resource exploitation impact organisms and ecosystems. Conservation biology integrates habitat protection, captive breeding, and genetic management to maintain diversity. Problem-solving must consider multiple constraints: ethical, social, and economic. Human decisions have global and lasting environmental effects.

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	evolutionary response to environmental pressures.				Life cycles vary widely but follow patterns related to reproduction and development.	
Common Assessments/ Major Projects	**CFA X 2** **CSA** Geological History Activity Evidence of evolution activity Classification/cladogram activity Animal Behavior Exploration Introduction to dissection lab	**CSA X 1** **CFA X 2** Porifera and Cnidaria modeling activity Annelida Dissection/exploration Worm phyla speed dating activity Animal behavior exploration Mollusk dissection/exploration	**Midterm Cumulative Assessment for Semester 1**	**CSA X 1** **CFA X 2** Arthropod dissection/exploration Arthropod, Echinoderm, and Mollusk modeling activity Cladogram characteristics activity Echinoderm dissection/exploration	**CSA** **CFA X 2** Vertebrate exploration/dissection Skeletal comparisons Body coverings research and lab design Symbiotic relationships activity	Biodiversity and Conservation **Project and Final Exam**
Level Specific Differentiation	● SWD/504 – Accommodations Provided as appropriate for the student ● ELL – Reading & Vocabulary Support ● Intervention Support – Some options for alternative assignments as well as test remediation ● Extensions – Enrichment Tasks and Projects can include Case Studies, Data Nuggets, project choice, and additional dissection opportunities.					● SWD/504 – Accommodations Provided as appropriate for the student ● ELL – Reading & Vocabulary Support ● Scaffolded project template ● Presentation can be video, whole class, small group, or individual

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Resources	- www.ck12.org - Glencoe Biology Textbook 2006, (Zebra book) workbook, text, and test bank - Holt Biology Interactive Reader study guide - Pearson online Biology Textbook - Argument-Driven Inquiry NSTA activity book - Shape of Life website videos and activities - YouTube videos of Dissections of specific animals - Bilogyjunction.com;, - Biologycorner.com; - Ms Maria Knowles' course sites (dissection resources) - Eyewitness videos - Preserved specimens slides for observation and dissection - BBC nature documentaries - Planet Earth - NAt geo animals - https://manoa.hawaii.edu/	