International Baccalaureate
Baccalauréat International
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3D Science Unit Planner

Marietta City Schools

Grade & Course: Zoology	**Topic:** Unit 1: Introduction to Classification and Evolution	**Duration:** 8 Weeks
Teachers: Zoology PLC Teachers		

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 environmental changes.

Narrative / Background Information
Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT) Students are expected to have background knowledge from their Biology class, which includes understanding basic cell structures, levels of organization, evolution, geologic history of life, and basic taxonomy and classification.
Year-Long Anchoring Phenomena: (LEARNING PROCESS) There is a wide variety of animal diversity across the planet.
Unit Phenomena (LEARNING PROCESS) **Phenomenon:** Fossils from the Cambrian Period have representatives of almost all animal groups identified today.
Inquiry Statement: The geological history of Earth has influenced the form and function of organisms through geologic time.
Global Context: Orientation of Time and Space
Key Concepts: Connections, Change, Relationships, and Systems
Related Concepts: Evidence, Patterns, Environment, and Consequences.
Approaches to Learning Skills: Communication: Presenting data Thinking: Critical thinking and evaluating claims Research: Interconnections
Science and Engineering Practices Developing and using Models & Constructing Explanations
Disciplinary Core Ideas: (KNOWLEDGE & SKILLS) Morphological traits, embryological development, and molecular evidence support evolutionary relationships. 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 evolutionary response to environmental pressures.

Crosscutting Concepts: (KNOWLEDGE & SKILLS)
Stability and Change
Structure and Function
Cause and Effect
Patterns

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)
Evolution results in progress; organisms are always getting better through evolution.
Individual organisms can evolve during a single lifespan.
Natural selection involves organisms trying to adapt.
Natural selection gives organisms what they need.
The fittest organisms in a population are those that are strongest, healthiest, fastest, and/or largest.
Taxa that appear near the top or right-hand side of a phylogeny are more advanced than other organisms on the tree.

Key Vocabulary: (KNOWLEDGE & SKILLS)
Evolution, natural selection, adaptation, convergence, divergence, speciation, taxonomy, classification, geological time scale, dichotomous key, scientific name, Cambrian explosion, asymmetry, behavior, morphology, embryology, fossils, radial symmetry, bilateral symmetry, coelom, pseudocoelom, protostome, and deuterostome

Inquiry Questions:

Factual

What is evolution?

What are the differences and similarities of natural selection and artificial selection?

What are the major types of speciation?

How does environmental pressure cause adaptation, thus leading to evolution?

What is a geological time scale and how is it used?

What are the major models used in evolution and classification?

Conceptual

How are Earth's geologic history and evolution related?

Using various scenarios, extrapolate how selective pressures lead to evolution?

How do scientists use models to show relationships between phyla using evidence of evolution?

What evidence explains the evolutionary history of animals over the geological history of Earth?

How can you know what happened millions of years ago if no one was there to see it?

Debatable

Does behavior play a role in the evolution of a species?

Does accumulation of adaptations proceed to complexity?

Summative assessment	
Assessment Tasks: **CSA X 1** **CFA X 2** Geological History activity Evidence of evolution activity Classification/cladogram activity Animal behavior exploration Introduction to dissection	Relationship between summative assessment task(s) and statement of inquiry: The tasks allow students to demonstrate their knowledge of animal characteristics, use data to create models to compare relationships among animals, understand different time periods and animals placed in that timeframe, and use skills and tools to identify animals.

Unit Objectives: - Teaching and learning is focused on effective teamwork and collaboration

Inquiry & Obtain: (LEARNING PROCESS)	Evaluate: (LEARNING PROCESS)	Communicate: (LEARNING PROCESS)
Week 1 **Introduction to course** Introduction to course What is Zoology activity. Major phyla posters	Complete and turn in the course introduction form after reviewing the classroom and syllabus. Submit the assignment section on Schoology. Create a poster with key terms and animal characteristics of a major phyla. Give to peers for evaluation.	Students share posters with class. Peer review: Give poster to adjoining group to assess with rubric.
Week 2 **Geological time scale** Geological time scale project CFA #1	Work in small groups to complete a poster on an assigned portion of the geological time scale. Submit it to the teacher for review. CFA to assess student knowledge of the geological time scale	Share a section in a class gallery walk and complete your graphic organizer. Ask questions to your peers as you complete

Weeks 3-5 **Evolution and Classification Introduction** Evidence of evolution activity Classification/cladogram activity CFA # 2	Knowledge will be used in subsequent assignments. CFA to assess student knowledge of cladograms, dichotomous keys, and the basics of evolution	Peer review cladograms and make self-corrections
Week 6 **CSA and remediation**	Evaluate skills learned in this unit through a CSA (both multiple-choice and short response questions).	Provide feedback and allow time for remediation to show growth/improvement.
Weeks 7-8 **Animal Behavior Exploration and Introduction to Dissections** Animal behavior exploration Intro dissection lab	Learn skills needed to dissect properly in labs– skills will develop over the subsequent units. Begin to learn how to design and implement an investigation.	Peer review a group's investigation design and give feedback for improvement. Receive and discuss feedback for both dissecting skills and investigation design from the teacher

Resources (hyperlink to model lessons and/or 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/

Reflection: Considering the planning, process, and impact of the inquiry

Prior to teaching the unit	During teaching	After teaching the unit