

### 3D Science Unit Planner

#### Marietta City Schools

<b>Grade &amp; Course:</b> Zoology	<b>Topic:</b> Unit 1: Introduction to Classification and Evolution	<b>Duration:</b> 8 Weeks
<b>Teachers:</b> Zoology PLC Teachers		

#### Georgia Standards and Content:

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 the understanding of 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:

SCIENTIFIC AND TECHNICAL INNOVATION - How do we understand the world in which we live?

- Modernization, industrialization and engineering

##### Approaches to Learning Skills:

###### SEP

- Asking Questions and Defining Problems
- Developing & Using Models
- Constructing Explanations
- Give and receive meaningful feedback
- Manage and resolve conflict, and work collaboratively in teams
- Plan short- and long-term assignments; meet deadlines
- Combine knowledge, understanding and skills to create products or solutions

##### Disciplinary Core Ideas: (KNOWLEDGE & SKILLS)

###### CORE IDEAS

- Characteristics of animals
- Evolution and Natural Selection
- Adaptations
- Cladograms and
- Geologic and Life History
- Taxonomy and Classification
- Dichotomous Keys

##### Crosscutting Concepts: (KNOWLEDGE & SKILLS)

- Stability and Change
- Scale, Proportion, and Quantity
- 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:

**CFA X 2**  
**CSA**

Geological History mini project

Relationship between summative assessment task(s) and statement of inquiry:

The tasks allow students to demonstrate their knowledge of

<p>Evidence of evolution activity</p> <p>Classification/cladogram activity</p> <p>Animal behavior introduction exploration #1</p> <p>Introduction to dissection lab</p>	<p>animal characteristics, use data to create models to compare relationships among animals. To understand different time periods and animals placed in that timeframe, and to use skills and tools to identify animals.</p>	
<p><b>Unit Objectives:</b> - Teaching and learning is focused on effective teamwork and collaboration</p>		
<p><b>Inquiry &amp; Obtain:</b> (LEARNING PROCESS)</p>	<p><b>Evaluate:</b> (LEARNING PROCESS)</p>	<p><b>Communicate:</b> (LEARNING PROCESS)</p>
<p><b>Week 1</b></p> <p><b>Introduction to course</b></p> <p>Introduction to course activity</p> <p>What is zoology activity</p>	<p>Turn in the course introduction form after reviewing the classroom to find location of important information - expectations, standards, supplies, inbox, etc.</p> <p>Submit on assignment section on Schoology assignment</p> <p>Create a booklet with key terms and animal characteristics of selected organism. Give to peers for evaluation.</p>	<p>Students share presentations with class.</p> <p>Peer review: Give booklet to adjoining group to assess with rubric.</p>
<p><b>Week 2</b></p> <p><b>Geological time scale</b></p> <p>Geological time scale mini project</p> <p>CFA #1</p>	<p>Work in small groups to complete a poster on an assigned portion of the geological time scale. Submit it to the teacher for review.</p> <p>CFA to access student knowledge of geological time scale (5-8?)</p>	<p>Share a section in a class gallery walk and complete your graphic organizer. Ask questions to your peers as you complete</p>
<p><b>Weeks 3-5</b></p> <p><b>Evolution and Classification Introduction</b></p> <p>Evidence of evolution activity</p> <p>Classification/cladogram activity</p> <p>CFA # 2</p>	<p>Knowledge will be used on subsequent assignments</p> <p>CFA to access student knowledge of cladograms, dichotomous keys and basics of evolution (10-15?)</p>	<p>Peer review cladograms and make self corrections</p>

<p><b>Weeks 6-7</b></p> <p><b>Animal Behaviour Exploration and Introduction to Dissections</b></p> <p>Animal behavior exploration</p> <p>Intro dissection lab</p>	<p>Learn skills needed to dissect properly in labs– skills will develop over next units</p> <p>Begin to learn how to design and implement an investigation</p>	<p>Peer review a groups investigation design and give feedback for improvement</p> <p>Receive and discuss feedback for both dissecting skills and investigation design from teacher</p>
<p><b>Week 8</b></p> <p><b>CSA and remediation</b></p>	<p>Evaluate skills learned in this unit through a CSA (both multiple choice and short response questions).</p>	<p>Provide feedback and allow time for remediation to show growth/improvement</p>

**Resources (hyperlink to model lessons and/or resources):**

- Miller and Levine Biology Textbook 2009, (Dragonfly 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
- Schoology school course

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

Prior to teaching the unit	During teaching	After teaching the unit