

Grade & Course: Zoology	Topic: Unit 5: Vertebrates--Chordata	Duration: 8.5 Weeks
Teachers: Zoology PLC Teachers		
<p>SZ1b: Analyze and interpret data to explain patterns in structure and function and construct a classification of representative animal taxa</p> <p>SZ3a: Plan and carry out investigations to determine patterns in morphology.</p> <p>SZ3b: Construct an explanation of life functions at appropriate level of organization for representative taxa</p> <p>SZ3c: Construct an explanation based on evidence to relate important structural changes across evolutionary history to key functional transitions.</p> <p>SZ4a: Construct explanations to relate structure and function of animals to ecological roles, including morphological, physiological, and behavioral adaptations</p> <p>SZ4b: Develop a model to explain patterns in various life cycles found among animals</p> <p>SZ4c: Construct an explanation based on evidence of the effects of symbiotic relationships between animals and between animals and other organisms</p>		
Narrative / Background Information		
<p>Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)</p> <p>Students are expected to have background knowledge from their Biology class, including an understanding of basic cell structures, levels of organization, evolution, the geologic history of life, and basic taxonomy and classification.</p>		
<p>Year-Long Anchoring Phenomena: (LEARNING PROCESS)</p> <p>There is a wide variety of animal diversity across the planet.</p>		
<p>Unit Phenomena (LEARNING PROCESS)</p> <p>Phenomenon: Humans share many structures with other vertebrate classes</p>		
<p>Inquiry Statement:</p> <p>Animal diversity is influenced by human activities.</p>		
<p>Global Context:</p> <p>SCIENTIFIC AND TECHNICAL INNOVATION - How do we understand the world in which we live? Modernization, industrialization, and engineering</p>		
<p>Key Concepts:</p> <p>Change, Communication, Connections, Relationships, Development, Form, and Systems</p>		
<p>Related Concepts:</p> <p>Environment, Interactions, Transformation, Patterns, Movement, Models, and Function</p>		
<p>Approaches to Learning Skills:</p> <p>Thinking Skills Critical thinking & Examine and evaluate evidence</p> <p>Communication Evaluating conclusions & Active listening</p> <p>Social Collaboration & Values of diversity</p>		

Self-management

Improvements, feedback, and reflection.

Research

Data methods & Interconnections

Science and Engineering Practices

Developing & Using Models

Constructing Explanations

Plan and carry out investigations

Analyze and interpret data

Developing and using Models & Constructing Explanations

Disciplinary Core Ideas: (KNOWLEDGE & SKILLS)

Classification based on vertebral column, limb structure, heart chambers, and reproductive strategies.

Differentiating taxa 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.

Life cycles vary widely but follow patterns related to reproduction and development

Crosscutting Concepts: (KNOWLEDGE & SKILLS)

Stability and Change

Structure and Function

Cause and Effect

Patterns

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)

All Chordates are Vertebrates

Chordates are Always Visible to the Naked Eye

All Chordates have a Backbone

Species Exist Independently of Each Other

The Body's Systems Operate Independently

Bones are Static and Unchanging

Key Vocabulary: (KNOWLEDGE & SKILLS)

Cartilage, neural crest, fin, scale, operculum, atrium, ventricle, nephron, spawning, swim bladder, tetrapod, cloaca, ectotherm, amnion, amniotic egg, carapace, air sac, feather, endotherm, incubate, sternum, cerebellum, diaphragm, gestation, glands, mammary glands, hair, placenta, uterus, marsupial, vertebrate, lung, capillaries, heart, herbivore, omnivore, carnivore, detritivore, scavenger, symbiosis, commensalism, predation, mutatism, mutualism, ecosystem, niche, cladogram,

Inquiry Questions:

<p>Factual</p> <p>What characteristics distinguish Chordates from other animals?</p> <p>What are the three main subphyla of Chordata?</p> <p>What are the 2 main subclasses of Chordata?</p> <p>What are the general characteristics of each main class of chordates?</p> <p>What are the three main groups of mammals?</p> <p>Conceptual</p> <p>How do structural differences in animals function to meet similar needs?</p> <p>How do vertebrates vary from invertebrates physiologically and anatomically?</p> <p>How are mammals anatomically different from other chordate classes?</p> <p>How are birds adapted for flight?</p> <p>Debatable</p> <p>Does one type of symbiosis have more of an impact on the ecosystem than another?</p>

Summative assessment

<p>Assessment Tasks: CSA X 1 CFA X 2</p> <p>Vertebrate exploration/dissection</p> <p>Skeletal comparisons</p> <p>Body coverings research and lab design</p> <p>Symbiotic relationships activity</p>	<p>Relationship between summative assessment task(s) and statement of inquiry:</p> <p>The tasks allow students to demonstrate their knowledge of the vertebrate groups. Students will use models and participate in dissections to analyze morphology. Additionally, they will plan and conduct an investigation into the various coverings of the skin. Finally, they will construct explanations to explore the impacts of symbiotic relationships between various phyla.</p>
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Unit Objectives: - Teaching and learning is focused on effective teamwork and collaboration

Inquiry & Obtain: (LEARNING PROCESS)	Evaluate: (LEARNING PROCESS)	Communicate: (LEARNING PROCESS)
<p>Weeks 1-5</p> <p>Major Systems and Life Functions</p> <ul style="list-style-type: none"> - Vertebrate dissection/exploration - Body coverings research and lab 	<ul style="list-style-type: none"> - Through dissection, students will analyze patterns in structure and function - Students will create informational products to explain patterns in structure and function and how it impacts ecological roles. 	<ul style="list-style-type: none"> - Receive and discuss feedback on dissecting skills from the teacher - Students will be formally assessed in a CFA - Students will create informational products (PPT, poster, Prezi) and receive teacher feedback based on a rubric. They will be allowed to revise before final submission. - Students will share their investigation design

<p>design</p> <ul style="list-style-type: none"> - Skeletal comparisons - CFA #1 	<ul style="list-style-type: none"> - Students will research, then plan and carry out an investigation to determine how different body parts - Using models, students will construct explanations to relate how evolution impacts adaptations. - Students will be assessed on their system knowledge on a CFA 	<p>with another group for peer feedback.</p> <ul style="list-style-type: none"> - Students will use a rubric to self- or peer-check, constructing explanations. Then they will have the opportunity to improve prior to submission. - Students will be formally assessed in a CFA
<p>Weeks 6-7 Ecological Roles, Symbiosis, and Life Cycles</p> <ul style="list-style-type: none"> - Symbiotic Relationships Activity - CFA #2 	<ul style="list-style-type: none"> - Students will construct explanations using evidence and research to determine the effects of symbiotic relationships between different phyla - Students will develop a model to explain life cycle patterns in 1 major class of vertebrates 	<ul style="list-style-type: none"> - Students will sit in small groups and discuss their symbiotic relationships. They will pose questions to each other to determine the impact of this relationship on the ecosystem. - Students will share their model with other groups and receive feedback via sticky notes. - Students will be formally assessed in a CFA
<p>Weeks 8 CSA and remediation</p> <ul style="list-style-type: none"> - CSA 	<ul style="list-style-type: none"> - Evaluate skills learned in this unit through a CSA (both multiple-choice and short response questions). 	<ul style="list-style-type: none"> - Students will be formally assessed in a CSA

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

- Shape of Life website videos and activities
- Glencoe Science Biology book
- YouTube videos of Dissections of specific animals
- 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
<p>-Think about and build onto the connections from Unit 1; allows students to see continuity in the course and helps them develop</p>		

<p>questions and make connections.</p> <p>-What major scaffolds do we need for each common activity?--- Provides equity in learning.</p> <p>-Make sure we are clearly stating to the students the goals and expectations for each lesson; helps students understand the why and promotes critical thinking skills.</p>		
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