

Grade & Course: Zoology	Topic: Unit 3: MIDTERM Evolution, Classification, Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida, and Mollusca	Duration: 2 Weeks
Teachers: Zoology PLC Teachers		

SZ1b: Analyze and interpret data to explain patterns in structure and function and construct a classification of representative animal 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

SZ1a: Construct an explanation of the relationships among animal taxa using evidence from morphology, embryology, and biochemistry.

SZ2a: Construct an explanation of the geological history of earth and the effects of major 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.

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Year-Long Anchoring Phenomena: (LEARNING PROCESS)

There is a wide variety of animal diversity across the planet.

Unit Phenomena (LEARNING PROCESS)

Phenomenon: Animal variety in form and function is still a field of discovery.

Inquiry Statement:

Animal form and function within invertebrate animal phyla and across key taxa influence how animals interact with their environment.

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

- Developing & Using Models
- Constructing Explanations
- Plan and carry out investigations
- Analyze and interpret data

Disciplinary Core Ideas:

(KNOWLEDGE & SKILLS)

CORE IDEAS

Distinguishing characteristics of animal groups with emphasis on evolution of transitional body structures and comparison of body systems as well as human and animal interactions.

Crosscutting Concepts:

(KNOWLEDGE & SKILLS)

- Systems and Systems Model
- Stability and Change
- Scale, Proportion, and Quantity
- Cause and Effect
- Patterns

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

- Sponges are not animals
 - Sponges and Cnidaria are considered “lower” or “simpler” because they lack traditional body plans
 - Sponges are all the same species
 - All worms are the same
 - All nematodes are pests
 - Annelid worms are asexual
 - mollusks are bugs/insects
- 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)

Multicellular, Porifera, choanocyte, spicules, suspension/filter feeding, phagocytosis, pinocytosis, osculum, sexual reproduction, Cnidaria, polyp, medusa, cnidocytes, radial symmetry, bilateral symmetry, asymmetrical, nerve net, asexual reproduction, tentacle, sessile vs motile, molluscs, head-foot, mantle, gills, lungs, coelom, circulatory system, radula, shell, annelid, septa, hydrostatic skeleton, jaw, nervous system, setae, platyhelminthes, nematodes, parasitic, mesoderm, ectoderm, endoderm, pharynx, ganglion, nerve cord, eye spots, diffusion, peristalsis, cuticle, nephridia, 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?

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

What are the major characteristics of sponges, cnidarians, mollusks, platyhelminthes, annelids and nematodes?

Describe how each major phyla feeds, respire and excrete waste.

Describe adaptations that allow parasitic worms to survive in their hosts.

Compare and contrast open and closed circulatory systems.

Conceptual

How are Earth's geologic history and evolution related?

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

What sponge body type do YOU think appears the most efficient and why?

Explain how radial symmetry is utilized in the movement of free-floating animals.

Why was the evolutionary development of the coelom important?

What is the evolutionary significance of segmentation? .

Debatable

Does accumulation of adaptations proceed to complexity?

Pick one of the phyla studied in this unit. If it goes extinct, use your knowledge of evolution and zoology to explain and justify if it would be detrimental or beneficial.

Summative assessment

Midterm

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

The tasks allow students to demonstrate their knowledge of the first 6 major invertebrate groups through the lens of evolution. Students will analyze morphology to connect how evolution has led to the development of more complex organ systems within each phyla.

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

Inquiry & Obtain:
(LEARNING PROCESS)

Evaluate:
(LEARNING PROCESS)

Communicate:
(LEARNING PROCESS)

Week 1
Creation of Review Material:
1 Pagers

- Review of major phyla, evolution and classification

- Students will review major themes from this semester by creating a 1 pager. These 1 pagers will summarize KEY information learned from each major topic.

- Students will analyze each other's 1 pagers and propose improvements.

Week 2
Midterm

- Part 1: Lab Practical
- Part 2: Multiple Choice (25 questions)

- Students will use specimen models to connect structure and function to evolution/classification. They will justify, describe, explain and hypothesize about various relationships between the animal phyla.
- Students will take a multiple choice midterm to assess knowledge of ecological roles, environmental impacts, habitats, evolution, classification and geological time scale.

- Students are being formally assessed on their 2 part midterm.

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

- Shape of Life website videos and activities
- 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