

Marietta City Schools

<b>Grade &amp; Course:</b> Zoology	<b>Topic:</b> Unit 5: <b>Invertebrates Part 2:</b> Porifera, Cnidaria, Platyhelminthes, Nematoda, and Annelida	<b>Duration:</b> 7 Weeks
<b>Teachers:</b> Zoology PLC Teachers		

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

**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:** 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. Analy

**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 reproduce asexually
- Mollusks are bugs/insects
- Squids and octopi do not have a shell

**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, mollusks, 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

**Inquiry Questions:**

**Factual**

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

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

Explain the difference between a medusa and a polyp

What stimulates feeding behaviors in each of the phyla?

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

Compare and contrast open and closed circulatory systems.

**Conceptual**

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

Describe possible ancestors for sponges. Justify your answers.

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?

Discuss the importance, threats, and location of coral reefs.

Which phyla of worms is the most important to the ecosystem?

**Debatable**

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**

<p>Assessment Tasks:  <b>CSA X 1</b>  <b>CFA X 2</b></p> <p>Porifera and Cnidaria modeling activity</p> <p>Annelida Dissection/exploration</p> <p>Worm phyla speed dating activity</p> <p>Animal behavior exploration</p>	<p>Relationship between summative assessment task(s) and statement of inquiry:</p> <p>The tasks allow students to demonstrate their knowledge of the first 6 major invertebrate groups. Students will create models, participate in dissections to analyze morphology, refine their animal behavior lab from unit 1, and analyze data and models to determine the evolutionary history of these major animal 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><b>Weeks 1-3</b>  Platyhelminthes, Nematoda &amp; Annelida</p> <ul style="list-style-type: none"> <li>- Annelid dissection/exploration</li> <li>- Worm Phyla speed dating</li> <li>- Animal behavior exploration (worm phyla)</li> <li>- CFA #1</li> </ul>	<ul style="list-style-type: none"> <li>- Students will draw and label models of Platyhelminthes, Nematoda &amp; Annelida. They will use these models to analyze specimens.</li> <li>- Students will “speed date” to gather information about the morphology, physiological, and behavioral characteristics of the 3 types of worms phyla</li> <li>- Students will investigate species of worm phyla behavior. They will then design and conduct an experiment</li> </ul>	<ul style="list-style-type: none"> <li>- During the speed dating, students will verbally discuss and analyze each other’s worms to determine the best “fit” for different scenarios.</li> <li>- Students will be formally assessed in a CFA.</li> <li>- Receive and discuss feedback dissecting skills from the teacher</li> <li>- Students will receive feedback on their experiment design from the teacher, modify and then complete the experiment.</li> </ul>
<p><b>Weeks 4-6</b>  Porifera and cnidaria:</p> <ul style="list-style-type: none"> <li>- Porifera and Cnidaria modeling activity</li> <li>- CFA #2</li> </ul>	<ul style="list-style-type: none"> <li>- Students will draw and label models of cnidaria and porifera. They will use these models to analyze specimens.</li> <li>- Students will develop a model of the life cycle of Cnidarians/Porifera and construct an explanation</li> </ul>	<ul style="list-style-type: none"> <li>- Students will analyze another groups model of the life cycle of cnidarians and provide constructive feedback</li> <li>- Students will be formally assessed in a CFA</li> </ul>

<p><b>Week 7</b> <b>CSA and remediation</b></p>	<ul style="list-style-type: none"> <li>- Evaluate skills learned in this unit through a CSA</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Provide feedback and allow time for remediation to show growth/improvement</li> <li>-</li> </ul>
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<p><b>Resources (hyperlink to model lessons and/or resources):</b></p> <ul style="list-style-type: none"> <li>- Shape of Life website videos and activities</li> <li>- YouTube videos of Dissections of specific animals</li> <li>- Eyewitness videos</li> <li>- Preserved specimens slides for observation and dissection</li> <li>- BBC nature documentaries</li> <li>- Schoology school course</li> </ul>
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**Reflection: Considering the planning, process, and impact of the inquiry**

Prior to teaching the unit	During teaching	After teaching the unit