

Zoology

UNIT 1: Evolutionary Origins of Kingdom Animalia



ESSENTIAL QUESTION

BIG IDEAS

How do we explain the diversity of the animal kingdom?

- Students will understand the mechanisms of Evolution through Natural Selection.
- Students will understand how to represent Evolutionary change and common ancestry in the Animal Kingdom.

GUIDING QUESTIONS

Content:

- How do we apply evidence for evolution to determine common ancestry in the Animal Kingdom?
- How does variation and the expression of traits within a population lead to Natural Selection?
- How do changing conditions lead to evolutionary change/adaptations or extinction?

Process

- Can students demonstrate evolutionary relationships visually through the development and interpretation of Cladograms?

Reflective

- What problems would arise if scientists did not use scientific nomenclature?
- What is the most useful evidence for evolution science can use to determine evolutionary relationships.
- Why is it important to understand evolutionary relationships in the animal kingdom?

FOCUS STANDARDS

- **HS-LS4-1.** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
- **HS-LS4-2.** Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment .
- **HS-LS4-5.** Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Zoology

UNIT 2: Sponges and Stingers



ESSENTIAL QUESTION

BIG IDEAS

How do we explain the diversity of the Basal Animal Phyla?

- Students will understand how to represent Evolutionary change and common ancestry within the Basal Phyla of the Animal Kingdom.
- Students will understand the anatomical structures and their functions within the Basal Phyla organisms.

GUIDING QUESTIONS

Content

- How are the various cells, tissues, and organs within a multicellular organism organized into a hierarchical system?
- How do we apply evidence for evolution to determine common ancestry in the Basal Phyla within the Animal Kingdom?

Process

- Can students demonstrate evolutionary relationships visually through the development and interpretation of Cladogram for the Basal Phyla?
- Can students determine connections between observed behaviors of live organisms and their internal structures?

Reflective

- What is the most useful evidence for evolution science can use to determine evolutionary relationships between these organisms?
- How are anthropogenic changes to the ocean ecosystem impacting these organisms?
- What would happen to the environment these organisms live in if these organisms went extinct?
- How would human life be impacted if these organisms went extinct?
- Which **one** of these organisms would be most likely to survive a mass extinction event?
- What structure from each organism in this group that would be considered its “superpower”?

FOCUS STANDARDS

- **HS-LS1-2.** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- **HS-LS4-1.** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

Zoology

UNIT 3: Worms, Shells, & Segmentation



ESSENTIAL QUESTION

BIG IDEAS

How do we explain the diversity of the Lophotrochozoans.

- Students will understand how to represent Evolutionary change and common ancestry within the Lophotrochozoa of the Animal Kingdom.
- Students will understand the anatomical structures and their functions within the Lophotrochozoa organisms.

GUIDING QUESTIONS

Content

- How are the various cells, tissues, and organs within a multicellular organism organized into a hierarchical system?
- How do we apply evidence for evolution to determine common ancestry in the Lophotrochozoa within the Animal Kingdom?

Process

- Can students demonstrate evolutionary relationships visually through the development and interpretation of Cladogram for the Lophotrochozoa?
- Can students determine connections between observed behaviors of live organisms and their internal structures?

Reflective

- What is the most useful evidence for evolution science can use to determine evolutionary relationships between these organisms?
- How are anthropogenic changes to the environment impacting these organisms?
- What would happen to the environment these organisms live in if these organisms went extinct?
- How would human life be impacted if these organisms went extinct?
- Which **one** of these organisms would be most likely to survive a mass extinction event?
- What structure from each organism in this group that would be considered its “superpower”?

FOCUS STANDARDS

- **HS-LS1-2.** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- **HS-LS4-1.** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

Zoology

UNIT 4: Molting, Jointed, Flying



ESSENTIAL QUESTION

BIG IDEAS

How do we explain the diversity of the Ecdysozoans.

- Students will understand how to represent Evolutionary change and common ancestry within the Ecdysozoa of the Animal Kingdom.
- Students will understand the anatomical structures and their functions within the Ecdysozoa organisms.

GUIDING QUESTIONS

Content

- How are the various cells, tissues, and organs within a multicellular organism organized into a hierarchical system?
- How do we apply evidence for evolution to determine common ancestry in the Ecdysozoa within the Animal Kingdom?

Process

- Can students demonstrate evolutionary relationships visually through the development and interpretation of Cladogram for the Ecdysozoa?
- Can students determine connections between observed behaviors of live organisms and their internal structures?

Reflective

- What is the most useful evidence for evolution science can use to determine evolutionary relationships between these organisms?
- How are anthropogenic changes to the environment impacting these organisms?
- What would happen to the environment these organisms live in if these organisms went extinct?
- How would human life be impacted if these organisms went extinct?
- Which **one** of these organisms would be most likely to survive a mass extinction event?
- What structure from each organism in this group that would be considered its “superpower”?

FOCUS STANDARDS

- **HS-LS1-2.** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- **HS-LS4-1.** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

Zoology

UNIT 5: Spiny Skin and Chordate Kin



ESSENTIAL QUESTION

BIG IDEAS

How do we explain the diversity of the Deuterostomians.

- Students will understand how to represent Evolutionary change and common ancestry within the Deuterostomia of the Animal Kingdom.
- Students will understand the anatomical structures and their functions within the Deuterostomia organisms.

GUIDING QUESTIONS

Content

- How are the various cells, tissues, and organs within a multicellular organism organized into a hierarchical system?
- How do we apply evidence for evolution to determine common ancestry in the Deuterostomia within the Animal Kingdom?

Process

- Can students demonstrate evolutionary relationships visually through the development and interpretation of Cladogram for the Deuterostomia?
- Can students determine connections between observed behaviors of live organisms and their internal structures?

Reflective

- What is the most useful evidence for evolution science can use to determine evolutionary relationships between these organisms?
- How are anthropogenic changes to the environment impacting these organisms?
- What would happen to the environment these organisms live in if these organisms went extinct?
- How would human life be impacted if these organisms went extinct?
- Which **one** of these organisms would be most likely to survive a mass extinction event?
- What structure from each organism in this group that would be considered its “superpower”?

FOCUS STANDARDS

- **HS-LS1-2.** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- **HS-LS4-1.** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.