Hall of Vertebrate Origins

BACKGROUND FOR EDUCATORS

Overview of Student Worksheets

Using worksheets, students observe fossils and read text to construct explanations about the story the hall tells about evolutionary relationships. Students are posed with a mystery: Why did the Museum group together animals from different time periods and geographic regions? To solve this mystery:

- **Part 1:** Students visit three zones in the Hall of Vertebrate Origins to collect clues. In each zone, students first explore a pillar that describes a specific trait (jaws, four limbs, watertight eggs), and then select an animal to investigate. Note: Students might find the term "watertight egg" confusing; this term refers to the fact that the shell prevents the moisture inside the egg from drying out, allowing the egg to incubate on land.
- **Part 2:** Students use the clues they collected to complete a cladogram.
- **Part 3:** Students visit the Orientation Center to watch a video and to read a panel about the fossil halls. Then using all the information gathered, students construct an explanation about why the Museum organized the Hall of Vertebrate Origins and other fossil halls the way they did.
- **Explore More:** Applying what they've learned about the organization of the fossil halls, students visit two other halls on the 4th floor—the Hall of Primitive Mammals and the Milstein Hall of Advanced Mammals—to observe more animals and discover how scientists organized them.

These observations help students experience a **natural phenomenon**—all vertebrates have a backbone and some have additional shared traits such as jaws, four limbs, and watertight eggs. This phenomenon can serve as an anchoring point in exploration and discussion as the students explore the **investigation question**: What traits do vertebrates have in common?

Extension Ideas

Back in the classroom, students create a classroom definition of the term "cladogram." Using this model as a guide, students then work in groups to create their own cladograms. Suggested resources:

- **"Understanding Cladistics" Activity**
  amnh.org/learn-teach/curriculum-collections/dinosaurs-activities-and-lesson-plans/understanding-cladistics
- **OLogy Tree of Life**
  amnh.org/explore/ology/biodiversity/tree-of-life2
  Students select four or more species and draw the branches and nodes to show how they are related.

Correlation to Standards

This activity supports the following Next Generation Science Standards:

Disciplinary Core Ideas	**LS4.A: Evidence of Common Ancestry and Diversity** Anatomical similarities and differences between organisms in the fossil record enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent.
Crosscutting Concepts	**Structure and Function** Observed patterns of forms guide organization and classification, and they prompt questions about relationships and the factors that influence them
Science and Engineering Practices	**Construct Explanations** Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation.