Fins Can Fool

Compare old and new ways of grouping living things

L.6.4.1 "Compare and contrast modern classification techniques (e.g., analyzing genetic material) to the historical practices used by scientists such as Aristotle and Carolus Linnaeus."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two kinds of clues historical scientists used to group animals. Circle the new kind of evidence modern scientists use to check how animals are related.

A Dolphin, a Shark, and a Closer Look

1 Imagine watching a dolphin swim beside a shark. Both have fins and sleek bodies, so they may seem like close relatives. Long ago, Aristotle sorted animals by traits he could observe, including whether they had blood, where they lived, and how they moved. If he grouped animals by where they lived, he could place the dolphin and shark together. That would describe their shared home, but it would miss a key difference: dolphins breathe air with lungs and feed milk to their young, while sharks breathe through gills.

2 Centuries later, Carolus Linnaeus built a system of groups within groups. He compared body structures and gave each species a two-part scientific name. A scientist using this approach would not rely only on fins or habitat. The dolphin's lungs and ability to feed milk to its young place it with mammals; the shark's gills place it with fish. Linnaeus's system gave scientists a shared way to name and organize living things. Yet similar-looking parts can still mislead scientists when unrelated animals adapt to similar places.

3 Today, scientists also compare DNA, the genetic material inside cells. DNA carries instructions inherited from earlier generations. When scientists compare stretches of DNA, shared patterns can provide evidence of common ancestors. DNA evidence supports placing dolphins with other mammals, not with sharks. Scientists still study body structures and behavior, so modern classification adds a new kind of evidence rather than throwing older observations away. A dolphin and a shark each have a streamlined shape that helps it swim, but that shape alone does not make them close relatives.

2 ANSWER WITH EVIDENCE

Use the passage

1. If Aristotle grouped animals by where they lived, how might he group the dolphin and shark? What difference would that grouping miss?

2. How would grouping by body structures separate the dolphin and shark, unlike grouping by habitat?

3. How does DNA evidence support a different grouping from one based only on where the dolphin and shark live?

4. What does modern classification keep from older methods, and what new evidence does it add?

3 YOUR TURN

Your own words

A bat and a bird both fly. A bat has fur and feeds milk to its young; a bird has feathers and lays eggs. In four or five sentences, compare how Aristotle, Linnaeus, and a modern scientist might group them. Explain why flight alone may mislead, and name evidence a modern scientist could use to check the groups.

ANSWER KEY

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GRADE 6 · L.6.4.1

PART 1 · READ AND MARK

Underline two kinds of clues historical scientists used to group animals. Circle the new kind of evidence modern scientists use to check how animals are related. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	If Aristotle grouped animals by where they lived, how might he group the dolphin and shark? What difference would that grouping miss?	**He might group them together because both live in water. That would miss that dolphins breathe with lungs and feed milk to their young, while sharks breathe through gills.**
2	How would grouping by body structures separate the dolphin and shark, unlike grouping by habitat?	**Body structures place the dolphin with mammals because it has lungs and feeds milk to its young, and the shark with fish because it has gills. Habitat groups them together.**
3	How does DNA evidence support a different grouping from one based only on where the dolphin and shark live?	**DNA evidence supports placing dolphins with other mammals, rather than with sharks just because both live in water.**
4	What does modern classification keep from older methods, and what new evidence does it add?	**Scientists still study observable traits, including body structures and behavior. They also compare DNA for evidence of common ancestors.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

If Aristotle grouped animals by how they moved, he might put the bat and bird together because both fly. Linnaeus's approach would compare more body structures, placing the furry bat that feeds milk to its young with mammals and the feathered bird with birds. Flight alone could mislead because animals in different groups can both have wings. A modern scientist could compare their DNA to check how closely related they are. That scientist would also consider their body structures rather than relying on DNA alone.

Accept answers that compare a possible movement-based group with groups based on several body traits and explain that modern scientists can check relationships with DNA. Aristotle used multiple observable traits, so students need not claim he always grouped flying animals together.