

Learning Target: I can use information gathered to sort the 5 types of vertebrates (Amphibians, Birds, Fish, Mammals, Reptiles)

Sorting Vertebrates Reading Passage: How Do We Classify Animals with Backbones?

Imagine you are a scientist standing in front of a riverbank in Georgia. You notice a turtle sunning itself on a log, a hawk circling above, and fish swimming below the water's surface. All three are vertebrates—animals with backbones—but they belong to different groups. How do scientists decide where each belongs?

Vertebrates are commonly sorted into **five main groups**: mammals, birds, reptiles, amphibians, and fish. Each group has unique characteristics, but some animals can be tricky to classify because they share overlapping traits. For example, dolphins live in the water like fish, but they are mammals because they breathe air through lungs, give live birth, and feed milk to their young. Similarly, bats have wings like birds but are mammals because they have fur and feed milk to their young.

Scientists use **observable traits**—like body covering, method of reproduction, and type of body temperature regulation—to classify animals.

- **Mammals** usually have hair or fur, feed their young with milk, and are warm-blooded.
- **Birds** have feathers, lay eggs, and are warm-blooded.
- **Reptiles** have scales, lay eggs on land, and are cold-blooded.
- **Amphibians** often begin life in water with gills, then develop lungs as adults, and are cold-blooded.
- **Fish** have scales, gills, and are cold-blooded throughout life.

But classification is not always simple. The platypus lays eggs even though it is a mammal. Crocodiles protect their young in ways more like mammals than other reptiles. These exceptions show why scientists continually refine classification systems. Sorting vertebrates requires **looking for patterns, comparing multiple traits, and thinking critically** rather than relying on just one characteristic.

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Multiple Choice Questions (DOK 3 & 4)

1. A scientist finds a new animal that lives in the ocean, has scales, breathes with gills, and lays eggs.

Which reasoning best explains why it should be classified as a fish?

- A. It lives in water, which makes it a fish.
- B. It has gills and scales, which are defining traits of fish.
- C. It lays eggs, which is the most important feature.
- D. It does not breathe air with lungs, so it cannot be a mammal.

2. Dolphins live in water but are classified as mammals. Which evidence BEST supports this classification?

- A. Dolphins have tails and fins.
- B. Dolphins use gills to breathe.
- C. Dolphins feed milk to their young.
- D. Dolphins lay eggs in the ocean.

3. Which reasoning BEST explains why the platypus challenges scientists' system of classification?

- A. It has fur but also lays eggs.
- B. It swims but does not have gills.
- C. It eats plants and animals.
- D. It lives in both water and land.

4. A student argues that a bat should be classified as a bird because it has wings. Which is the BEST rebuttal?

- A. Bats are mammals because they give birth to live young and feed them milk.
- B. Bats are not birds because they cannot fly as well as birds.
- C. Bats live in caves, not trees, unlike most birds.
- D. Bats are warm-blooded, while birds are cold-blooded.

5. Which claim is BEST supported by the example of crocodiles protecting their young?

- A. All reptiles act like mammals.
- B. Some reptiles share behavioral traits with mammals.
- C. Crocodiles should be reclassified as mammals.
- D. Mammals and reptiles have no similarities.

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6. Which reasoning process would BEST help a scientist classify a new vertebrate?

- A. Observing the environment it lives in.
- B. Comparing its physical traits to those of known groups.
- C. Recording what it eats most often.
- D. Choosing the group with the most animals in it.

7. Suppose scientists discover an animal with feathers that lays eggs but regulates its body temperature like a reptile. What does this suggest about classification systems?

- A. They are perfect and never change.
- B. They should only use one trait.
- C. They may need to be updated as new evidence appears.
- D. They should separate animals only by what they eat.

8. Which scenario BEST demonstrates higher-level thinking about classification?

- A. Memorizing the five groups of vertebrates.
- B. Listing animals that are mammals.
- C. Explaining why dolphins are not fish even though they live in water.
- D. Naming reptiles that lay eggs.

9. A student finds an animal with moist skin, lays eggs in water, and spends part of its life breathing through gills. Which is the BEST reasoning for classifying it as an amphibian?

- A. Amphibians begin life in water with gills and later develop lungs.
- B. Amphibians live only in water.
- C. Amphibians are always cold-blooded.
- D. Amphibians have scales like reptiles.

10. Why do scientists use multiple characteristics rather than just one when classifying vertebrates?

- A. Because animals may share one trait but belong to different groups.
- B. Because one trait is always enough to classify correctly.
- C. Because classification depends only on where an animal lives.
- D. Because scientists prefer to make the groups uneven.