

2.5

A Closer Look at the Animal Kingdom

TRY THIS: LOOK AT DIFFERENT ANIMALS

Skills Focus: observing, inferring, classifying

The Animal kingdom is made up of many different organisms. For example, both a spider and an ant belong to the Animal kingdom. Work with a partner to make two specimen boxes that you can use to observe these small animals. Using a hand trowel or a spoon, carefully lift a spider into one of your boxes and an ant into the other. Observe the spider and the ant. When you have finished observing them, gently place them back where you found them.

1. How are these two animals the same? How are they different?
2. Compare the ant and the spider with another animal, such as a dog or a cat. What are some of the similarities and differences? Why do you think all these organisms belong in the Animal kingdom?

There are more than one million different species in the Animal kingdom. All animals are multicellular organisms that get their nutrients and energy by eating other organisms. But animals come in a great variety of forms, from spiders to sparrows to sponges (Figure 1). To better understand the diversity of animal life, scientists classify animals into groups based on their internal and external structures.



Figure 1

Although they may look like plants, sponges are simple animals.

Vertebrates and Invertebrates

Scientists divide all the organisms in the Animal kingdom into two main groups: **vertebrates** (animals with backbones) and **invertebrates** (animals without backbones). Vertebrates include birds, fish, and mammals. Invertebrates include insects, worms, squids, sponges, sea anemones, and crabs. Vertebrates are the animals that you're most familiar with, but invertebrates are much more common. Scientists estimate that invertebrates make up more than 95% of all animal species. One group of invertebrates—arthropods—includes all the world's insects, shellfish, and spiders. **Figure 2** shows some of the groups that make up the Animal kingdom.

LEARNING TIP

Check your understanding of vertebrates and invertebrates by describing the difference in your own words.

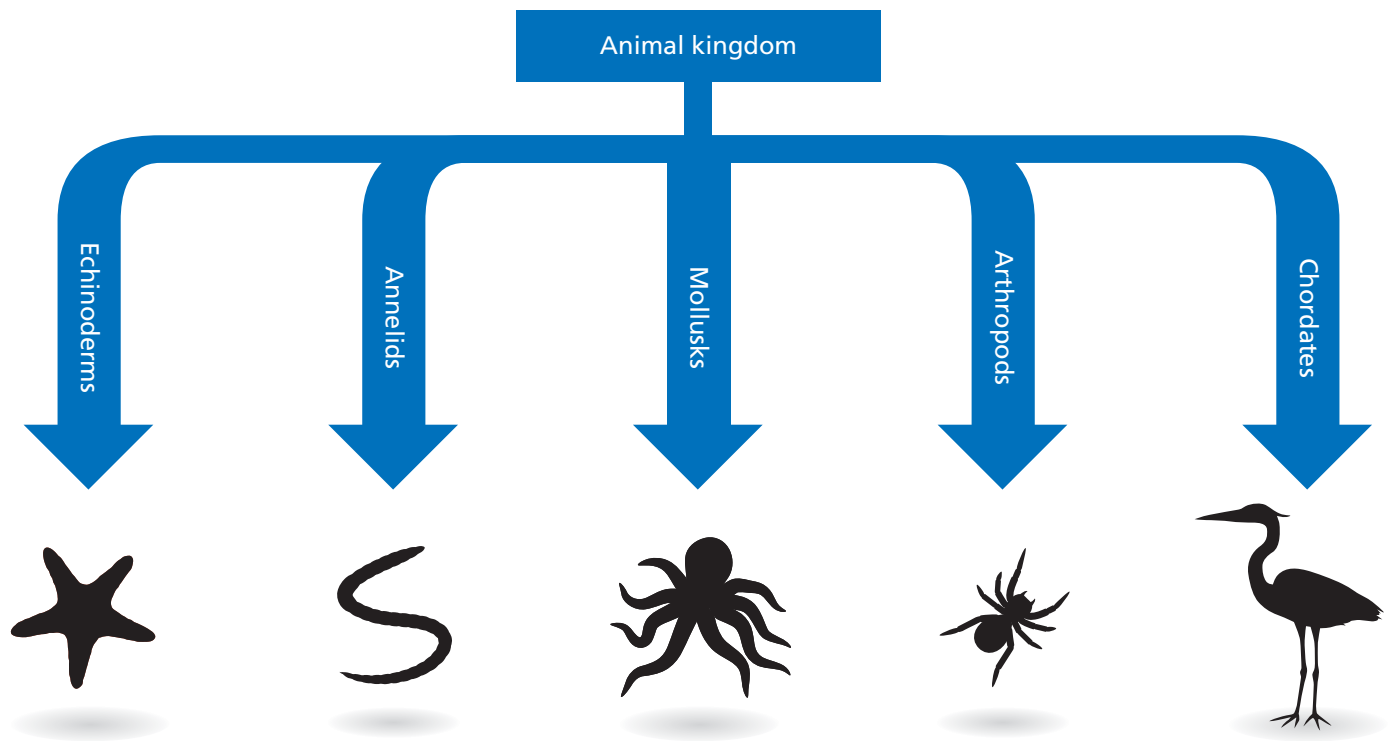


Figure 2

All vertebrates belong to the Chordate group.

Classes of Vertebrates

Scientists divide the vertebrates into classes, based on the internal and external structures they share. There are five main classes of vertebrates: **fish**, **amphibians**, **reptiles**, **birds**, and **mammals**. Each class is defined in **Table 1** on page 36. You are probably familiar with many of the animals in these classes.

Table 1 The Characteristics of Vertebrates

Class	Examples	Characteristics
Fish	salmon, whale shark, ray, seahorse	<ul style="list-style-type: none"> live only in water breathe through gills use fins to move lay eggs or give birth to live young body temperature changes with the environment
Amphibians	frog, toad, salamander	<ul style="list-style-type: none"> young live in water and breathe through gills adults live mainly on land and breathe with lungs lay eggs in water young change form as they grow, for example, growing legs body temperature changes with the environment
Reptiles	crocodile, alligator, lizard, snake, turtle	<ul style="list-style-type: none"> some live on land; some live in water breathe through lungs most have claws that can be used to dig or climb many lay soft, leathery eggs on land body temperature changes with the environment
Birds	eagle, parrot, cardinal, chicken, penguin, puffin	<ul style="list-style-type: none"> breathe through lungs have wings, feathers, and hollow bones most can fly lay eggs in a protective shell hatchlings are cared for by parents maintain a constant body temperature
Mammals	dolphin, bat, mouse, kangaroo, lemur, human	<ul style="list-style-type: none"> most live on land, some live in water breathe through lungs most have hair or fur covering their bodies most give birth to live babies mother produces milk to feed her babies maintain a constant body temperature



▶ CHECK YOUR UNDERSTANDING

1. Explain why a spider is considered a member of the Animal kingdom.
2. What characteristic can you use to separate all animals into two groups?
3. Look at **Figure 3**. How can you tell that this animal is not a vertebrate?



Figure 3

An earthworm

4. Use **Table 1** as a guide to help you identify which class of vertebrates an organism would belong to if it had the following characteristics:
 - breathes through lungs and lays eggs that have a shell
 - lives in the water and breathes through lungs (**Figure 4**)
 - lives on land and lays eggs in water
 - has a constant body temperature and gives birth to live babies



Figure 4