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Unit  
6

## Vertebrates and Invertebrates

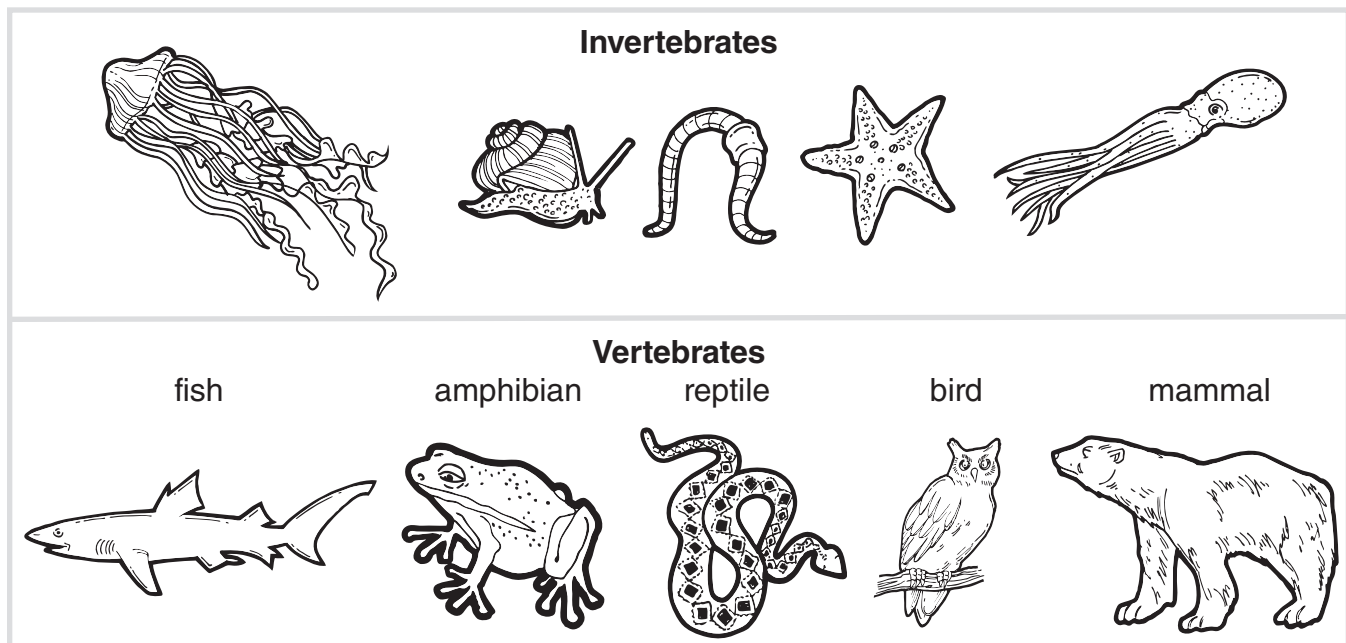
## DID YOU KNOW THAT . . . ?

- *There are more than a million species of invertebrates.*
- *Most creatures on Earth are either insects or worms.*
- *About 97% of all species on Earth are invertebrates.*
- *About 3% of all species are vertebrates.*
- *There are about 40,000 species of vertebrates, including reptiles, amphibians, fish, and mammals.*
- *Humans are vertebrates.*

Scientists have classified more than a million species of animals. A **species** is a group of animals—all of which could breed together and reproduce. Different species cannot breed and reproduce with each other. For example, horses of different types can breed together and produce young. They are in the same species. Horses cannot breed with cows or sheep or lions—each of which is a different species.

There are two main groups of animals in the animal kingdom: **invertebrates** and **vertebrates**. Invertebrates have no backbones, although some of them have an outside case or exoskeleton for protection. About 97% of all animal species are invertebrates. These include worms, insects, snails, spiders, jellyfish, crabs, octopuses, and starfish.

Vertebrates have backbones. They have a skeleton inside the body—not on the outside like insects and spiders. There are about 45,000 species of vertebrates divided into five main groups: fish, amphibians, reptiles, birds, and mammals. Most vertebrates have well-developed senses and a central nervous system controlled by a relatively large brain.

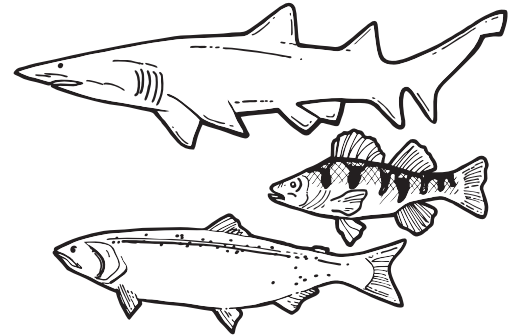


# Vertebrates and Invertebrates

Unit  
6

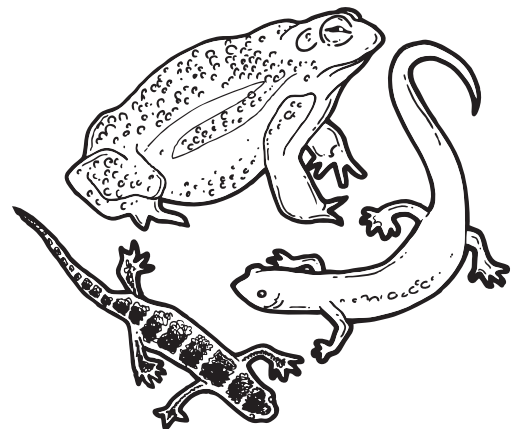
## VERTEBRATES: FISH

There are about 20,000 species of fish—some smaller than a centimeter and others 40 feet long. Fish include manta rays, sharks, sea horses, salmon, perch, and many other species. Fish live in water and get their oxygen from water using gills. Their bodies are covered with thousands of scales. They have fins that help them move through the water, change directions, and stay upright. Most fish lay eggs but some are **live-bearers** who give birth to their babies in the water. Fish are **cold-blooded**. Their bodies are the temperature of the surrounding water, and they cannot regulate their internal temperature.



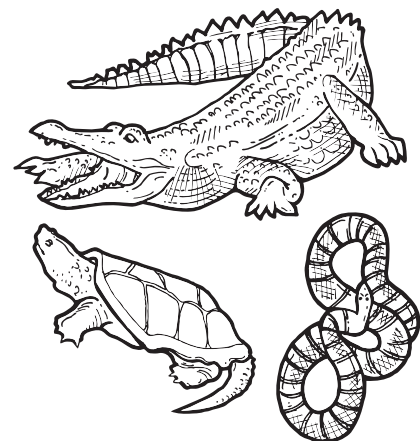
## VERTEBRATES: AMPHIBIANS

There are at least 2,500 different species of amphibians including toads, frogs, salamanders, and newts. Amphibians are also cold-blooded and unable to regulate their temperature. In warm weather, their temperature is warm. Amphibians spend part of their lives on land and part in the water. They usually lay their eggs in water. Their young are called tadpoles and breathe through gills. They develop air-breathing lungs as adults. They also breathe through their skins on land or in water. Even on land they usually require a moist environment. Many burrow into the soil to keep their skins from drying out.



## VERTEBRATES: REPTILES

There are about 6,000 known species of reptiles including lizards, snakes, crocodiles, turtles, alligators, and tortoises. Reptiles are covered with dry plates or scaly skin. Most lie low to the ground and most have four legs, except for some snakes and lizards. Reptiles are also cold-blooded like fish and amphibians. Reptiles live primarily on land and breathe air through lungs. Most reptiles lay eggs on land but a few are live-bearers (give birth to their young). Some reptiles are venomous (poisonous).

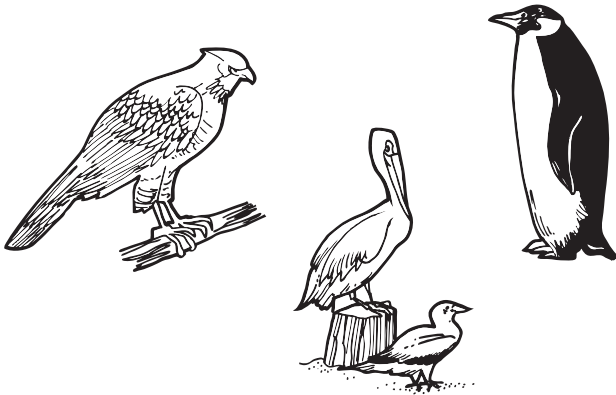




Unit  
6

## Vertebrates and Invertebrates

## VERTEBRATES: BIRDS



There are about 8,500 species of birds. All birds have feathers and wings, and nearly all species can fly. Most birds have light or hollow bones to make flight easier. All birds have a beak, but birds do not have teeth. They breathe air through lungs. They are **warm-blooded** animals, which means they can regulate their own temperature. They make their own heat by burning food in their bodies. Warm-blooded animals can be warm even if the outside temperature is cold. All birds reproduce by laying eggs.

## VERTEBRATES: MAMMALS

There are about 4,000 species of mammals. All mammals have hair or fur. They are warm-blooded and thus able to regulate their temperature. All but three species of egg-laying mammals give birth to live babies. All mammal mothers feed their young milk from their bodies. The largest land animal is a mammal, the elephant. The largest sea animal (and the largest animal which ever lived) is the great blue whale, a mammal. Humans are classified as mammals. Mammals have adapted to live in almost every climate and ecosystem from the frozen Arctic to the tropical heat of the equator.

## Facts to Remember

- The animal kingdom is divided into vertebrates and invertebrates.
- There are about 1,000,000 species of animals.
- About 40,000 species of animals are vertebrates. All of the rest are invertebrates.
- There are five main groups of vertebrates: fish, amphibians, reptiles, birds, and mammals.

## VOCABULARY

**cold-blooded**—an animal unable to produce its own heat

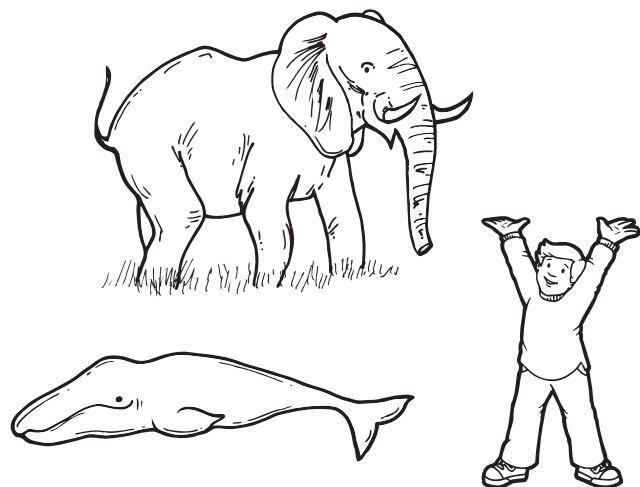
**invertebrates**—animals without backbones

**live-bearer**—animals which give birth to their babies

**species**—a group of living creatures which can breed and reproduce with each other

**vertebrates**—animals with backbones and internal skeletons

**warm-blooded**—an animal able to make its own heat



# Vertebrate or Invertebrate?

**Directions:** Use the information on pages 58–60 to label each animal listed below as either *vertebrate* or *invertebrate*.

garden snail	lion	monkey	earthworm
_____	_____	_____	_____
jellyfish	robin	whale	shark
_____	_____	_____	_____
crab	horse	penguin	toad
_____	_____	_____	_____
pill bug	frog	rattlesnake	lizard
_____	_____	_____	_____
silkworm	butterfly	hawk	human
_____	_____	_____	_____
honeybee	starfish	perch	manta ray
_____	_____	_____	_____
sea horse	salamander	crocodile	parrot
_____	_____	_____	_____
zebra	koala	mouse	iguana
_____	_____	_____	_____