

**Further Reading**

## **Topic** Characteristics of Vertebrate and Invertebrate Animals

The classification of animals into vertebrates and invertebrates highlights their characteristics, adaptations and differences. Vertebrates and invertebrates play essential roles in ecosystems. Encourage learners to explore and observe nature to provide experiential learning.

- Vertebrates: Animals with a backbone.
- Invertebrates: Animals without a backbone.
- Nature is rich in biodiversity, with 97% of animal species being invertebrates.

### **Characteristics of Vertebrates**

- Have a backbone (vertebral column). This is the key feature of all vertebrates
- Possess an internal skeleton (endoskeleton).
- Advanced nervous and organ systems.

### **Five Classes of Vertebrates**

1. Fish – Live in water, have gills, and are cold-blooded.
2. Amphibians – Live on land and water, moist skin.
3. Reptiles – Dry, scaly skin, lay eggs on land.
4. Birds – Have feathers, hollow bones for flight.
5. Mammals – Have fur/hair, give birth to live young, warm-blooded.

### **Characteristics of Invertebrates**

- No backbone, many have exoskeletons.
- Simple to complex body structures.
- Diverse movements (flying, crawling, swimming).

### **Major Invertebrate Groups**

1. Arthropods – Largest group (insects, crabs, spiders).
2. Mollusks – Soft-bodied (snails, octopuses).
3. Echinoderms – Spiny-skinned (starfish, sea urchins).
4. Annelids – Segmented worms (earthworms).
5. Cnidarians – Stinging tentacles (jellyfish, corals).

## Further Reading

# Topic

## Comparing Vertebrates and Invertebrates

Feature	Vertebrates	Invertebrates
Backbone	Present	Absent
Skeleton	Internal (Endoskeleton)	External (Exoskeleton) or none
Nervous System	Complex	Simple to complex
Movement	Muscles and bones	Muscles, exoskeletons, or body extensions
Examples	Mammals, fish, birds	Insects, mollusks, worms