

GRADE 11 STUDY GUIDE | 2025

Animal Biodiversity

Life Sciences

1. Classification of Animals

- Phylum Porifera: sponges; no tissues; filter feeders; sessile
- Phylum Cnidaria: jellyfish, coral; radial symmetry; stinging cells (nematocysts); 2 layers
- Phylum Platyhelminthes: flatworms (tapeworm, planaria); bilateral symmetry; no body cavity (acoelomate)
- Phylum Nematoda: roundworms; cylindrical; complete digestive tract; many are parasites
- Phylum Annelida: segmented worms (earthworm, leech); coelom; closed circulatory system
- Phylum Arthropoda: largest phylum; exoskeleton (chitin); jointed appendages; insects, spiders, crustaceans
- Phylum Mollusca: soft-bodied; mantle; snails, clams, octopus; many with shells
- Phylum Echinodermata: starfish, sea urchin; spiny skin; radial symmetry as adults; water vascular system
- Phylum Chordata: notochord; dorsal nerve cord; pharyngeal gill slits at some stage; vertebrates + invertebrate chordates

2. Vertebrate Classes

- Class Agnatha: jawless fish (lamprey); cartilaginous skeleton
- Class Chondrichthyes: cartilaginous fish (sharks, rays); no scales; internal fertilisation
- Class Osteichthyes: bony fish; scales; operculum covers gills; swim bladder for buoyancy
- Class Amphibia: frogs, salamanders; moist skin; ectothermic; metamorphosis; return to water to reproduce
- Class Reptilia: lizards, snakes, crocodiles; dry scaly skin; ectothermic; amniotic egg (on land)
- Class Aves: birds; feathers; endothermic; hollow bones; beaks; lay hard-shelled eggs
- Class Mammalia: hair/fur; endothermic; mammary glands; live birth (except monotremes); diaphragm

3. Adaptations and Ecological Roles

Animals are adapted to their environments by morphology (body structure), physiology (body function) and behaviour. Natural selection drives these adaptations.

- Camouflage: colour and pattern match environment (e.g. chameleon, stick insect)
- Mimicry: resembling another organism (Batesian: harmless mimics harmful species)
- Thermoregulation: endotherms maintain constant body temperature; ectotherms use environment
- Predator-prey relationships drive co-evolution