Animal Kingdom *Fact Sheet*

The Animal Kingdom

There are **over 1.5 million** living animal species.

Over 90% of all animals are **invertebrates**, and around **two-thirds of all known animals are insects** (and it's likely that there are millions more insects still to be discovered)!

The scientific study of animals is called **zoology**. A scientist who studies animals is a **zoologist**.

Animals are **organisms** (living things) belonging to the **animal kingdom**, one of several "kingdoms' into which scientists group living things.

The scientific name for the animal kingdom is **Animalia**.

*Other kingdoms include **Plantae** – the plant kingdom, and **Fungi** – the fungus kingdom.*

Animal Classification

A kingdom can be sub-divided into ever-smaller groups containing ever-more closely-related animals.

These groups are (from kingdom to species): **kingdom**, **phylum** (plural: phyla), **class**, **order**, **family**, **genus** (plural: genera), **species**.

Therefore, members of the cat family (Felidae) are more closely related to one another than they are to members of the dog family (Canidae).

*However, because both the cat and the dog family are in the order **Carnivora**, both cats and dogs are more closely related to each other than they are to animals of order **Primates** (e.g. gorillas).*

Binomial Names

All animals have a two-word scientific name, known as a **binomial name**.

Using binomial names means that zoologists from anywhere in the world can refer to specific animals without confusion.

Examples of binomial names:

- ***Canis lupus*** = wolf
- ***Panthera tigris*** = tiger
- ***Panthera leo*** = lion
- ***Homo sapiens*** = human

Binomial names are always written in italics.

The first word in a binomial name is the species' **genus**. A genus is a group containing closely-related species.

*Did you notice that the first part of the scientific name of the tiger and the lion are the same? That's because they belong to the same genus: **Panthera**.*

You can find out more about animal classification on this page:

https://www.activewild.com/animal-classification/

Vertebrates Vs Invertebrates

Animals with backbones are known as **vertebrates**; animals without backbones are known as **invertebrates**.

Vertebrates have their own group: **Vertebrata**; an invertebrate is any animal *not* in this group.

Invertebrates

Scientists estimate that up to **97% of *all* animal species are invertebrates.**

Some invertebrates are more closely related to vertebrates than they are to other invertebrates.

The majority of invertebrates are **arthropods.**

Arthropods are animals belonging to the phylum **Arthropoda**, such as **insects**, **crustaceans**, **crustaceans**, **millipedes** and **centipedes**.

Mollusks

With around **120,000 species**, the largest group of invertebrates that *aren't* arthropods are **mollusks.**

Mollusks belong to the phylum **Mollusca.**

Examples of mollusks include animals such as **Bivalves** (clams, oysters, etc.), **Gastropods** (slugs & snails) and **Cephalopods** (octopuses, squid, cuttlefish, etc.).

Other Non-Arthropod Invertebrate Groups

- **Sponges** (phylum Porifera)
- **Flatworms** (phylum Platyhelminthes)
- **Ringed worms** (phylum Annelida)
- **Cnidarians** (phylum Cnidaria): jellyfish, sea anemones, corals, etc.
- **Echinoderms** (phylum Echinodermata): star-fish, sea urchins, sea cucumbers, etc.

Arthropods (Phylum Arthropoda)

Around 90% of all invertebrates are **arthropods**

Characteristics of arthropods include a **segmented body**, **jointed legs**, and a **hard exoskeleton**, which is periodically molted as the animal grows.

Insects

Insects have been around for **400** million **years.**

(By comparison, humans first appeared 200 thousand years ago).

Insects were the **first flying animals**, and are the **only flying invertebrates**.

Around **one million insect species** have been identified, around 40% of which are **beetles**, which make up the largest insect group.

Many more insects are still to be discovered; it's estimated that there may be as many as **10 million** extant (living) insect species.

An insect's body is divided into **three parts**: the **head**, **thorax** and **abdomen**.

Insects have **six legs**, which are attached to the thorax, along with the **wings** (not all insects have wings). Insects have a **single pair of antennae**, which is attached to the head section.

Well-known insect groups include the orders **Diptera** (flies); **Lepidoptera** (butterflies and moths); **Coleoptera** (beetles); and **Hymenoptera** (bees, wasps and ants).

You can find out more about insects on this page:
https://www.activewild.com/insects/

Arachnids (Class Arachnida)

The arthropod group **Arachnida** is home to animals such as **spiders**, **scorpions**, **mites**, and **camel spiders**. There are **around 100,000 arachnid** species.

Around half of all arachnids are **spiders.**

Most arachnids have **eight legs**, and an additional pair of appendages known as **pedipalps**, which in some arachnids, resemble legs. Unlike insects, **arachnids lack antennae.**

You can find out more about arachnids on this page:
https://www.activewild.com/arachnids/

Crustaceans (Subphylum Crustacea)

Crustaceans include animals such as **crabs**, **lobsters**, **shrimps** and **water fleas**.

Most crustaceans live in the sea, but some, such as **woodlice**, are adapted to living on land.

A distinguishing characteristic of crustaceans is their **two pairs of antennae**. Many crustaceans have a hard protective **carapace** (shell).

Some crustaceans have **biramous limbs**, which split into two branches.

You can find out more about crustaceans on this page: **https://www.activewild.com/crustaceans/**

Vertebrates (Subphylum Vertebrata)

Vertebrates are animals with a **backbone**. Unlike invertebrates, vertebrates form a distinct taxonomic group: the subphylum **Vertebrata**, which contains around **70,000 species**.

Fish (Various Taxa)

Around **half of all vertebrates are fish**.

Fish are **aquatic**, **vertebrate** animals with **streamlined bodies** and **fins** instead of limbs. Nearly all fish breathe with **gills** – organs that extract oxygen from the water.

Nearly all fish are **cold-blooded**, although some species (notably tuna and some shark species) are **warm-blooded**.

Types of fish:

- **Jawless fish**: hagfish, lampreys, etc.
- **Cartilaginous fish** (Chondrichthyes): sharks, rays and skates, etc.
- **Bony fish** (Osteichthyes): ray-finned fish, lobe-finned fish

The skeletons of bony fish are made of **bone**, whereas those of cartilaginous fish are made of a tough, flexible substance called **cartilage**.

Jawless fish are primitive animals that **lack jaws**, and instead have circular, sucker-like mouths.

Most bony fish are **ray-finned fish**, with fins supported by thin spines.

The other group of bony fish are the **lobe-finned fish**, which have thick, fleshy fins.

Lobe-finned fish are the ancestors of all terrestrial (land-dwelling) vertebrates (including humans).

You can find out more about fish on this page: **https://www.activewild.com/fish/**

Amphibians (Class Amphibia)

Types of amphibians:

- **Anura** (frogs and toads)
- **Urodela** (salamanders)
- **Apoda** (caecilians)

Most amphibians begin their lives in water, hatching from eggs as **larvae**, and breathing with **gills**.

Amphibians then undergo a process known as **metamorphosis**, developing **lungs** and **limbs** that allow them to live on land.

Amphibians are **cold-blooded**, lacking the means to regulate the temperature of their bodies.

Caecilians are burrowing amphibians that resemble worms or snakes. They are found both on land and in water.

Salamanders are amphibians with long tails and cylindrical bodies. Most have four legs, but some species spend most of their lives in the water and only have two small front limbs.

As adults, **frogs and toads** lack tails, and have well-developed hind legs for jumping and swimming.

You can find out more about amphibians on this page: **https://www.activewild.com/amphibians/**

Reptiles (Class Reptilia)

Types of reptiles:

- **Turtles**
- **Crocodilians**
- **Squamates** (lizards and snakes)
- **Rhynchocephalians** (the tuatara)

There are around **11,700 living reptile species**.

Reptiles evolved around **310 million years ago**. With bodies protected by tough, **waterproof skin** and **scales**, and able to lay **eggs with shells**, reptiles – unlike amphibians – are not reliant on water for reproduction, and can therefore occupy a greater range of terrestrial habitats.

Reptiles are **cold-blooded** and most **lay eggs**, although some reptiles give birth to live young.

You can find out more about reptiles on this page: **https://www.activewild.com/reptiles/**

Birds (Class Aves)

Birds are **feathered**, **warm-blooded**, **egg-laying vertebrates**, most of which are able to **fly**. They are found on every continent and live in a wide range of habitats.

Birds evolved from dinosaurs around 150 million years ago, gradually losing their teeth and tails and developing **beaks**.

Today, there are around **10,000 bird species**. More than half are **passerines**, or "perching birds", of order **Passeriformes**.

Passerine feet have three forward-facing toes and one backward-facing toe, an adaptation for perching on branches.

Other well-known bird groups include **ratites** (flightless birds such as ostriches, cassowaries, and kiwis), **Psittaciformes** (parrots), **Sphenisciformes** (penguins) and **Accipitriformes** (eagles, hawks and vultures).

You can find out more about birds on this page: **https://www.activewild.com/birds/**

Mammals (Class Mammalia)

Types of mammals:

- **Monotremes** (egg-laying mammals): platypus, echidnas
- **Marsupials** (pouched mammals): kangaroos, wombats, opossums, etc.
- **Placental mammals**: primates, carnivorans, rodents, bats, etc.

Mammals are **warm-blooded**, **air-breathing vertebrates** with **hair** and milk-producing **mammary glands** with which females feed their young.

There are around **6,400 species of mammals**, all but five of which **give birth to live young**.

Monotremes

The **five mammals** that don't give birth are the **platypus** and four species of **echidna**, which together comprise the monotremes, a group of mammals that reproduce by **laying eggs**.

Marsupials

Marsupials give birth to small, relatively undeveloped young, known as "**joeys**".

Joeys undergo further development within a special **pouch** in the female marsupial's body.

There are around **335 marsupial species**, around 70% of which are found in Australia.

Placental Mammals

The majority of living mammals are placental mammals. The developing fetus of a placental mammal receives nourishment from an organ called a **placenta** while in the mother's womb.

Humans *are placental mammals in the great ape family,* **Hominidae***, which is part of the order* **Primates**.

You can find out more about mammals on this page: **https://www.activewild.com/mammals/**