

Background information for teachers

Classification of living things - additional material *(see booklet, page 35)*

This material complements that given in the booklet on pages 35 to 36. In the booklet we give an outline of the main features of members of the plant kingdom whereas in this website material we include reference to the other major groups in the Five Kingdom Classification, namely the Prokaryotes, the Protocists, the Fungi and the Animalia.

The Five Kingdom classification

Currently, the most widely accepted classification of living things is the 'Five Kingdom' Classification. The major groups, known as **kingdoms** are: Prokaryotae, Protocista, Fungi, Plantae, Animalia. Some examples are shown below.

In the **Prokaryotes**, the genetic material is not contained within a membrane, so there is no nucleus. In the remaining four kingdoms, organisms all have cells with a nucleus and are known as **Eukaryotes**.



PROKARYOTES (Monera)

- All have cells
 - No nucleus
 - Very small (microscopic)
 - Single cells (unicellular) or clusters of cells
- Include bacteria*



Protocists

- An odd group of organisms that don't fit comfortably into any other group! Include algae (e.g. seaweeds) and Protozoa (e.g. *Paramecium* and *Plasmodium*).



Fungi

- Most are multicellular (a few unicellular)
- Non-motile
- Cell walls contain chitin (but not cellulose)
- Do not contain chlorophyll (so unable to carry out photosynthesis)
- Obtain food by absorbing materials through cell walls (often from dead and decaying material).



Lichens are usually grouped with fungi But they are really an association between a fungus and another organism such as an alga.



Plantae

- Multicellular organisms
- Non-motile (do not move from place to place)
- Contain chlorophyll (so make food through photosynthesis – but a few parasitic forms)
- Cell walls contain cellulose

There are four main groups of plants:

Mosses and liverworts



A thalloid liverwort *Marchantia*



Wall screw moss *Tortula* sp.

Ferns, horsetails, etc.



Male Fern *Dryopteris filix-mas*



Horsetail *Equisetum telmateia*



Conifers



Male and female 'flowers' of Scots Pine *Pinus sylvestris*



Norway Spruce *Picea abies*
with cones

Flowering plants



Wild strawberry *Fragaria vesca*
Flowers and fruit



Field Maple *Acer campestre*
Flowers and fruit



Field Maple *Acer campestre*
Flowers and fruit

Animalia

- Multicellular organisms
- Able to move from place to place
- Do not contain chlorophyll (so unable to carry out photosynthesis)
- Obtain food by eating other organisms

There are two main groups within the animals: the invertebrates (without a backbone) and the vertebrates (with a backbone).

Invertebrates - important groups include the molluscs, insects and arachnids



A mollusc:
Banded snail *Helix hortensis*



An insect:
Wasp beetle *Clytus arietis*



An arachnid:
Nursery-web spider *Pisaura mirabilis*

Vertebrates - important groups include fishes, amphibians, reptiles, birds and mammals



An amphibian:
Common frog *Rana temporaria*



A bird:
Robin *Erithacus rubecula*



A mammal:
Dog (English springer spaniel)