

Biodiversity & Classification

Scope

Topic	Topic Breakdown
Biodiversity and classification 19 Marks	<p><u>Classification schemes</u>: a way of organizing biodiversity</p> <p><u>Brief history of classification</u>: scientist attempt to classify organisms based on shared features. As information increases classification changes</p> <p>One of the currently accepted classification systems is the <u>Five-kingdom system</u>; Animalia, Plantae, Fungi, Protista and Monera (Bacteria)</p> <p>-naming things in science: species concept and <u>binomial system</u>.</p> <p>Linnaeus (Carl von Linne) and his role in classification systems: Why do we use Latin? -<u>differences between</u> prokaryotes and eukaryotes</p> <p><u>Main groupings of living organisms</u> are bacteria, protists, fungi, plants and animals.</p>



Adapted from DBE revision guidelines

Biodiversity & classification

Notes

A variety of life forms is known as **biodiversity**.

Bio - means life & diversity means variety

Most of the diverse species found in South Africa are **endemic** or **indigenous**

Endemic: Species that occur only in that particular area

Indigenous: Species that occur naturally in an area

Classification means to categorise an organism to a particular group according to their differences and similarities.

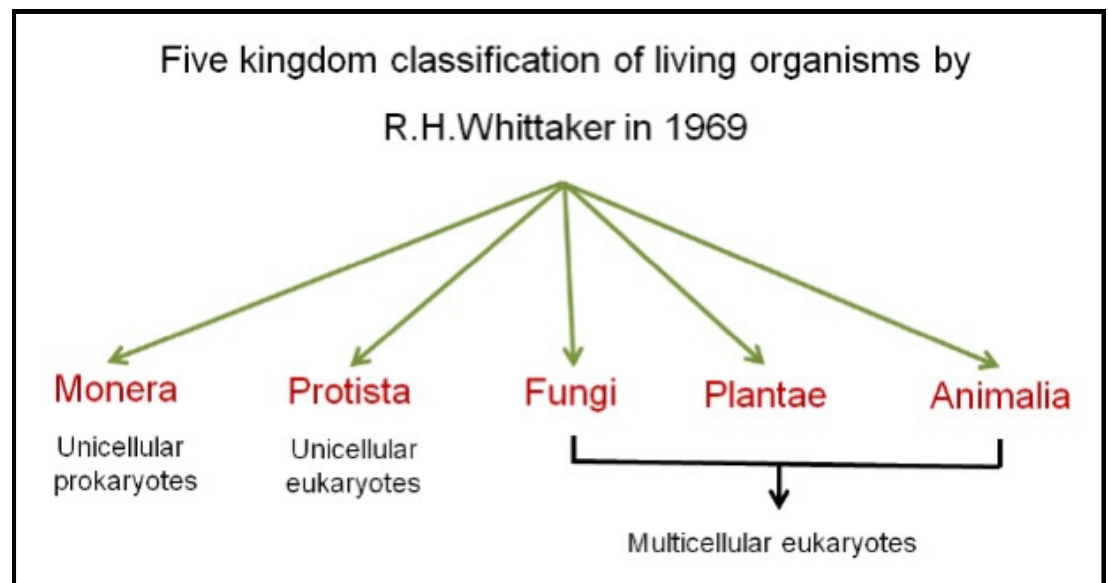
Species are classified using what we call **Taxonomic classification**. These names are of the Latin language, a neutral language to avoid confusion.

The five kingdom system

By Robert Whittaker (1996)

He classified organisms to the five kingdoms:

- Kingdom Monera
- Kingdom Protista
- Kingdom Fungi
- Kingdom Plantae
- Kingdom Animalia



Unicellular organisms are single celled while **multicellular organisms** have many cells

Prokaryotes do not have a membrane bound nucleus while **Eukaryotes** have a membrane bound nucleus

Plants & Animals are multicellular eukaryotes. However, plants are **autotrophic** (make their own food) while animals are **heterotrophic** (unable to make their own food).

Biodiversity & classification

Taxonomy

Taxonomy refers to the science of naming and classifying a wide range of living things

By **Carl Linnaeus**, he developed a hierarchical classification of organisms as follows.

Kingdom - Phylum - Class - Order - Family - Genus - Species

He then developed the **binomial naming system** (A two name system where organisms' scientific name is comprised of the Genus and species name)

The scientific name of a Human : *Homo sapien*



Human



Chimpanzee

Taxon		
Species	<i>sapiens</i>	<i>troglodytes</i>
Genus	<i>Homo</i>	<i>Pan</i>
Family	Hominidae	Hominidae
Order	Primates	Primates
Class	Mammalia	Mammalia
Phylum	Chordata	Chordata
Kingdom	Animalia	Animalia

RULES

Typed in italics
Underlined when written
Genus first letter is capitalised &
species name in small caps

Taxonomic keys are another way to classify organisms

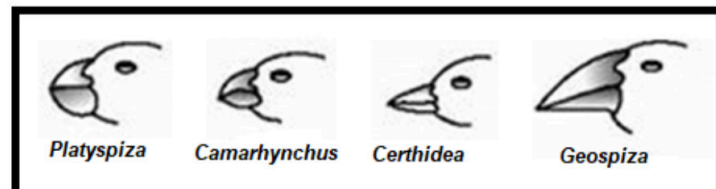
Pictorial key

- These keys have illustrations.
- These illustrations maybe in the form of pictures, photographs or a combination of these.
- Organisms are identified by comparing them to the illustrations



Verbal key

1. Do the organisms have a definite nucleus?
YES. Go to question 2. If **NO** then its Kingdom **Monera**.
2. Is the organism multicellular or unicellular?
If it is **unicellular** then Kingdom **Protista**. If it is **multicellular** then go to question 3.
3. Is the organism autotrophic?
YES then its Kingdom **Plantae**. If **NO** then go to question 4
4. Does the organism digests food outside its body and then take it in?
YES then its Kingdom **Fungi**. If **NO** then its Kingdom **Animalia**



Biodiversity & classification

Terminology

- **Binomial naming:** A two name system
- **Biodiversity:** A variety of life forms
- **Endemic:** found only there
- **Eukaryotes:** A true nucleus is a nucleus that is surrounded by a nuclear membrane. Organisms that possess true nuclei are called eukaryotes. The organelles in eukaryotes are all bound by membranes.
- **Prokaryotes:** All organisms with nuclear material not enclosed by membranes are called prokaryotes. All the organelles found in prokaryotes do not have membranes.
- **Autotrophic organisms:** are those that can manufacture their own food by photosynthesis.
- **Heterotrophic organisms:** are those organisms that are unable to manufacture their own food.
- **Indigenous:** Occur naturally in an area
- **Saprophytes:** organisms that feed on dead and decaying matter.
- **Species:** Organisms with similar characteristics and can interbreed to produce a fertile offspring.
- **Taxonomy:** The science of naming
- **Unicellular:** Organisms that are made up of one cell only.
- **Multicellular:** Organisms that are made up of many cells.