

CHARACTERISTICS OF LIFE

- ◆ Specific size and shape
- ◆ Metabolism – the sum of all the chemical activities of the cells that provide for an organism's growth, maintenance and repair
- ◆ Movement – Some organisms have obvious movement from muscular contraction (e.g. swim, fly, run). Some move by beating of cilia or flagella, or oozing like an amoeba. Others like corals and oysters do not move from place to place.
- ◆ Irritability – response to a stimulus (e.g. light or chemicals such as food)
- ◆ Growth – increase in cellular mass, and/or increase in number of cells
- ◆ Reproduction – formation of another organism. Since viruses cannot reproduce on their own without being inside a host cell, they are not regarded as living organisms.
- ◆ Adaptation – ability to adapt to an environment, by either seeking a more suitable environment, or by undergoing modifications to be better fitted to its present surroundings

INTRODUCTION TO CLASSIFICATION

- ◆ Taxonomy – the hierarchical system of naming, describing and classifying organisms using structural characteristics
- ◆ Structural Characteristics – the features of an organism relating to structure (e.g. number of appendages, backbone, shape of leaf)
- ◆ Characteristics that are not used in classification – As organisms to be identified are often dead and not usually in their normal habitat, certain characteristics are not useful in identification (e.g. body temperature, habitat, movement).
- ◆ Reasons for Classification –
 1. To provide a scientific name that can be communicated by scientists from different countries
 2. To show relationships between groups
 3. To identify organisms accurately (e.g. poisonous organisms)

BRIEF OVERVIEW OF THE 5 KINGDOMS

KINGDOM	MAIN CHARACTERISTICS	EXAMPLES
Monera	<ul style="list-style-type: none"> ◆ Unicellular ◆ Prokaryotic ◆ Cell wall usually ◆ Some autotrophic, some heterotrophic 	<ul style="list-style-type: none"> ◆ Bacteria ◆ Cyano-bacteria (blue-green algae)
Protista	<ul style="list-style-type: none"> ◆ Unicellular ◆ Eukaryotic ◆ Some autotrophic, some heterotrophic 	<ul style="list-style-type: none"> ◆ <i>Paramecium</i> ◆ <i>Amoeba</i> ◆ Some algae ◆ Slime moulds
Fungi	<ul style="list-style-type: none"> ◆ Unicellular or multicellular ◆ Eukaryotic ◆ Heterotrophic ◆ Cell wall ◆ No chloroplasts 	<ul style="list-style-type: none"> ◆ Mushrooms ◆ Moulds ◆ Yeast

Plantae	<ul style="list-style-type: none"> ◆ Unicellular or multicellular ◆ Eukaryotic ◆ Autotrophic ◆ Cell wall ◆ Chloroplasts 	
Animalia	<ul style="list-style-type: none"> ◆ Unicellular or multicellular ◆ Eukaryotic ◆ Heterotrophic ◆ No cell walls nor chloroplasts 	<ul style="list-style-type: none"> ◆ Humans ◆ Birds ◆ Worms ◆ Spiders ◆ Coral

CLASSIFICATION OF ORGANISMS

- ◆ Classification within a Kingdom – Kingdom, Phylum (or Division), Class, Order, Family, Genus, Species
- ◆ Mnemonic - King Paul Cries Out For Good Soup
- ◆ Species - a group of organisms with similar characteristics that can reproduce naturally to produce fertile offspring

<i>RANK OF TAXONOMY</i>	<i>HUMAN</i>	<i>CRAY-FISH</i>	<i>BOTTLE-BRUSH</i>	<i>PARA-MECIUM</i>
<i>KINGDOM</i>	Animalia	Animalia	Plantae	Protista
<i>PHYLUM or DIVISION</i>	Chordata	Arthropoda	Tracheophyta	Protozoa
<i>CLASS</i>	Mammalia	Crustacea	Angiospermae	Ciliata
<i>ORDER</i>	Primates	Decapoda	Myrtales	Holotricha
<i>FAMILY</i>	Hominidae	Palinuridae	Myrtaceae	Para-meciidae
<i>GENUS</i>	<i>Homo</i>	<i>Jasus</i>	<i>Callis-temon</i>	<i>Para-mecium</i>
<i>SPECIES</i>	<i>Homo sapiens</i>	<i>Jasus ialandei</i>	<i>Callis-temon linearis</i>	<i>Para-mecium caudatum</i>

IMPORTANT TERMS

- ◆ Unicellular – composed of only one cell
- ◆ Multicellular – composed of more than one cell; the different cells may show differentiation (i.e. specialised functions)
- ◆ Autotrophic – able to obtain energy from a source that is from the physical environment, by using light energy (photosynthetic) or chemical energy (chemosynthetic)
- ◆ Heterotrophic – need to obtain their energy from other living organisms or their dead remains
- ◆ Prokaryotic – simple cell types that do not contain organelles in membranes; usually smaller than eukaryotic cells (e.g. bacteria)
- ◆ Eukaryotic – complex cell types that contain organelles enclosed in membranes

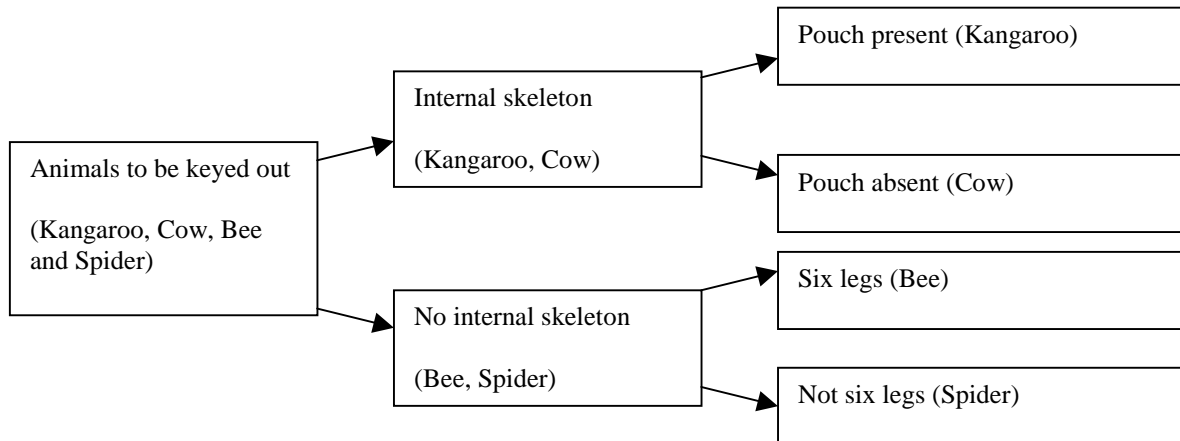
- ◆ [Radial Symmetry](#) – ability to be divided into many equal parts along radii (e.g. top view of a jellyfish)
- ◆ [Bilateral Symmetry](#) – ability to be divided into two mirror-like parts (e.g. front view of a human)

MAKING A DICHOTOMOUS KEY

Example: Here are two examples of keys to show how to key out



organisms, such as a kangaroo, a cow, a bee and a spider. Shown are a **branching key** and a **numbered key**.



- 1a. Internal skeleton.....go to 2
- 1b. No internal skeleton..... go to 3

- 2a. Pouch present.....kangaroo
- 2b. Pouch absentcow

- 3a. Six legs.....bee
- 3b. Not six legs..... spider