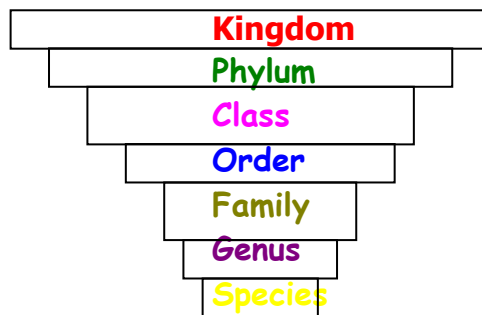


# Biology revision notes – Form 3

## The seven vital functions

- 1 Feeding – Organisms need energy. Plants make food from simple substances (autotrophic). Animals take in complex food and break it down (heterotrophic).
- 2 Movement – animals move from place to place, plants move parts.
- 3 Respiration – the breakdown of food to release energy
- 4 Sensitivity – the response of the organism to stimuli
- 5 Growth – growing bigger in size and most of the time complexity
- 6 Reproduction – producing organisms to ensure species does not die out
- 7 Excretion – removing waste and unwanted substances

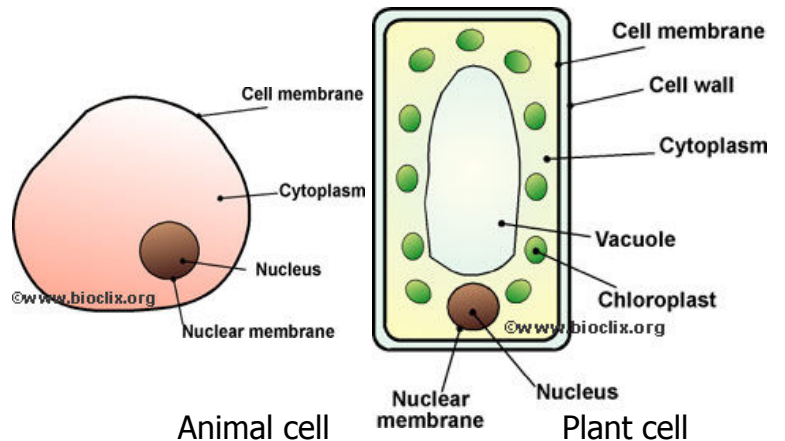
**Classification** - organisms are divided into different groups to make identifying them easier.



**Binomial or Linnaeus system** – involves a two word name written in latin and underlined. 1<sup>st</sup> name is the genus with capital letter, 2<sup>nd</sup> name is the species

## Differences

Animal cell	Plant cell
Food reserve = glycogen	Food reserve = starch
Not present	Vacuole
Not present	Chloroplast
Not present	Cell wall



## 6 Kingdom system

- 1 Animals – vertebrates and invertebrates
- 2 Plants - flowering and non-flowering plants
- 3 Viruses - viruses bordering between living and non-living
- 4 Protista - unicellular plant like and animal like organisms
- 5 Fungi - moulds and mushrooms
- 6 Bacteria - Most are parasites. No membrane bound nucleus.

## Animals - Vertebrates – with backbone

GROUP	DESCRIPTION
Fish	Live in water. Breathe using gills. Cold blooded. Skin covered with scales. Lay eggs
Reptiles	Live mainly on land. Breathe using lungs. Covered with scale. Four legs. Eggs have soft shells. Cold blooded.
Mammals	Live mostly on land. Breathe using lungs. Skins usually covered with hair. Have legs Give birth to live young. Warm blooded.
Amphibians	Live in fresh water or damp places. Breathe using lungs or moist skins. Four legs. Mate in water. Lay small unshelled eggs. Cold blooded
Birds	Live on land. Breathe using lungs. Skin covered with feathers. Two legs and wings. Most fly. Lay hard shelled eggs. Warm blooded.

## Invertebrates – without backbone

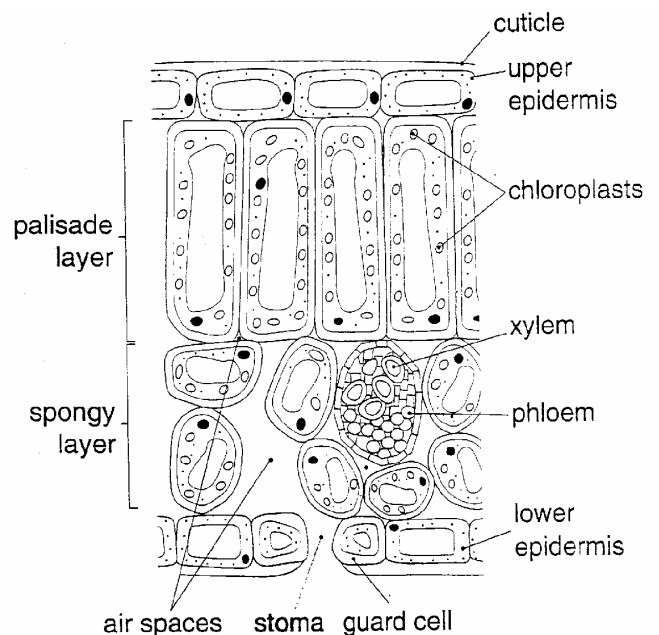
GROUP	DESCRIPTION
Coelenterates	Mainly sea animals. Have stinging tentacles to catch prey.
Flatworms	Worms with very thin flat bodies. Often live in water, Many are parasites inside other animals.
Roundworms	Many are parasites. Thin bodies, round in cross-section
Segmented worms	Most live in water (sea), some in soil. Body divided into segments.
Molluscs	Have 1 or 2 shells and foot or tentacles. Some on land, most in water.
Arthropods	Body divided into segments. Legs have moving joints. Hard outer covering (exoskeleton)
Echinoderms	All live in the sea. Bodies built in 5 rays or arms. Some form a ball.

## Plants

- Algae – live in fresh water, can also be unicellular.
- Mosses and Liverworts – bryophytes. They have no true stems or leaves. 2 generations – gametophyte (haploid) produces gametes, sporophyte (diploid) produces spores
- Ferns - pteridophytes
- Conifers – coniferophytes – mostly trees or shrubs with woody stems producing seed bearing cones.
- Flowering plants - angiosperms
  - a) Monocotyledons – e.g. grasses. They have parallel veins, no midrib. Flowers in parts of 3's. 1 cotyledon present in seed.
  - b) Dicotyledons – e.g. roses, buttercup, wall flower. They have branching veins, midrib, flowers in parts of 4's or 5's. 2 cotyledons present in seed.

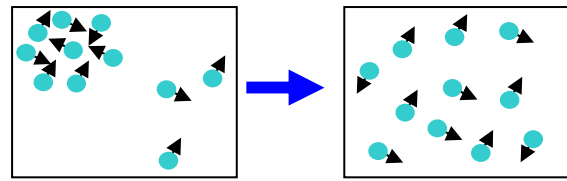
Plants produce food by photosynthesis. The organ for this is the leaf which contains chlorophyll in its leaves which traps sunlight. Leaves have a large area to capture sunlight.

The chloroplasts are concentrated in the top layer where more sunlight falls.

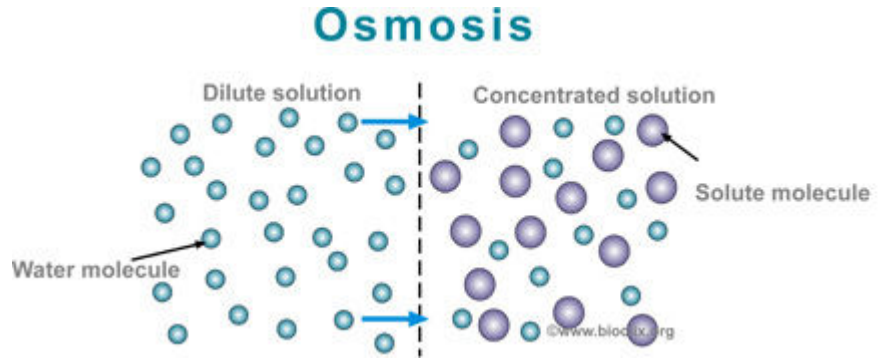


Stomata are used to control water content in plants and turgidity.

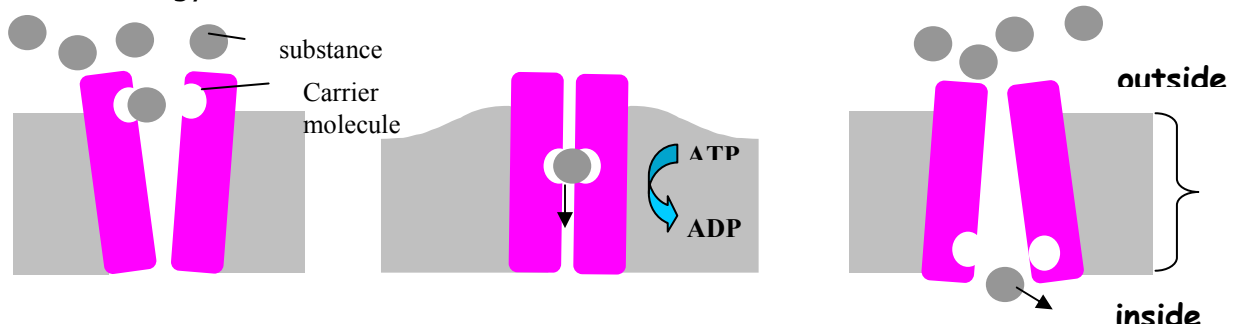
**Diffusion** – movement of molecules from a region of high concentration to a region of low concentration  
 = A passive process



**Osmosis** – the diffusion of water across a semi-permeable membrane from the dilute to the concentrated solution  
 = A passive process



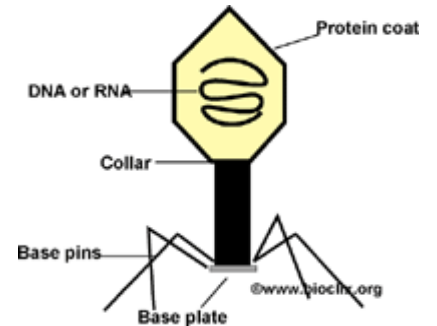
**Active transport** – control of what substances enter or leave the cell membrane. It consumes energy.



**Viruses**

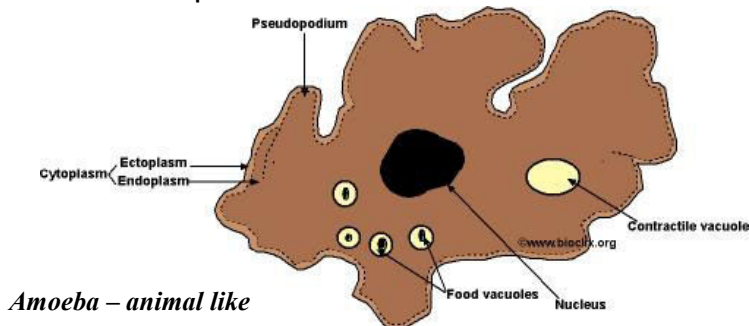
They border between living and non living because they :- do not feed, reproduce inside other cells, do not move.

E.g. AIDS, influenza, herpes.

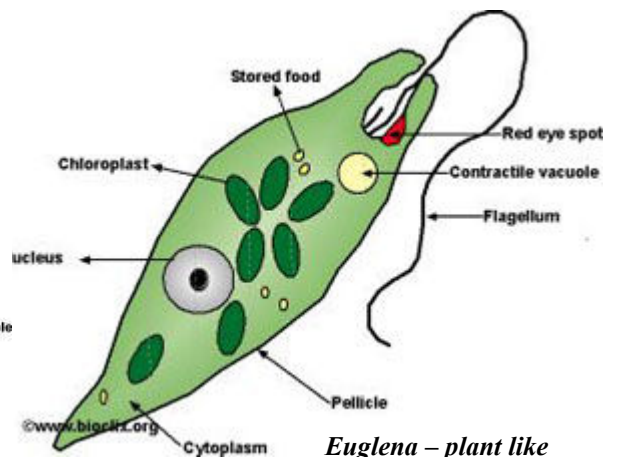


**Protista**

Single celled organisms resembling either animals or plants.



*Amoeba – animal like*



*Euglena – plant like*

## ***Flowering Plants - Angiosperms***

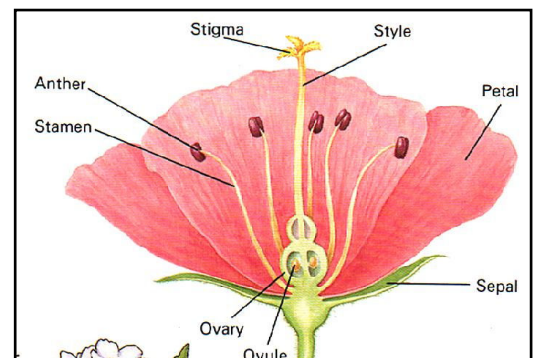
<b>Monocots</b>	<b>Dicots</b>
Parallel veins	Branched veins
No mid rib	Mid rib present in leaves
Fibrous root system	Tap root system
One cotyledon present in their seeds	Two cotyledons present in their seeds
Flower parts in threes or multiples of	Flower parts in fours or fives or multiples of.
Vascular bundles in stems scattered	Vascular bundles in stems arranged in a circle

**Remember :** *Xylem transports water and minerals while phloem transports food.*

### ***Flowers***

They can be:

- 1 Wind pollinated – no petals, stamens hanging out, large quantity of pollen which is light.
- 2 Insect pollinated – produce nectar, coloured petals, small quantity of pollen.



### **Abiotic and Biotic factors – influence the growth of a population**

Abiotic – non living factors e.g. space, light, wind, temperature, humidity etc.

Biotic - the living factors e.g. animals, plants, microorganisms.

### **Tropisms**

Can be of 3 types

- 1 Geotropism – response of plant to gravity = root +vely geotropic (grows towards gravity), shoot –vely geotropic (grows away from gravity)
- 2 Phototropism – response of plant to light = shoot +vely phototropic (grows towards light), root -vely phototropic (grows away from light)
- 3 Touch – venus fly trap snaps shut when its hairs on the leaves are brushed by insects.

Hormone involved in tropisms is **Auxin**

The clinostat is an instrument that revolves very slowly exposing the plant to the stimulus from all sides. It is used in control experiments.

### **Competition**

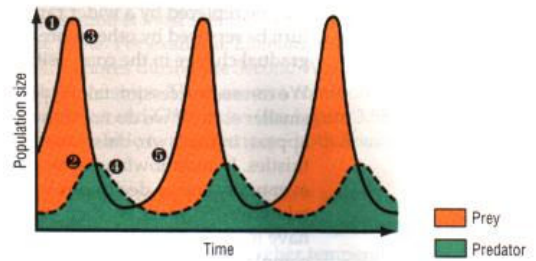
Can be of two types:

- 1 **Intraspecific competition** – competition between individuals of the same species
- 2 **Interspecific competition** – competition between individuals of different species.

Competition controls the size of a population. Only the fittest and most adapted individuals will be selected.

### ***Predator-prey***

Predator = organism that is eating the other organism  
 Prey = the organism that is being eaten.

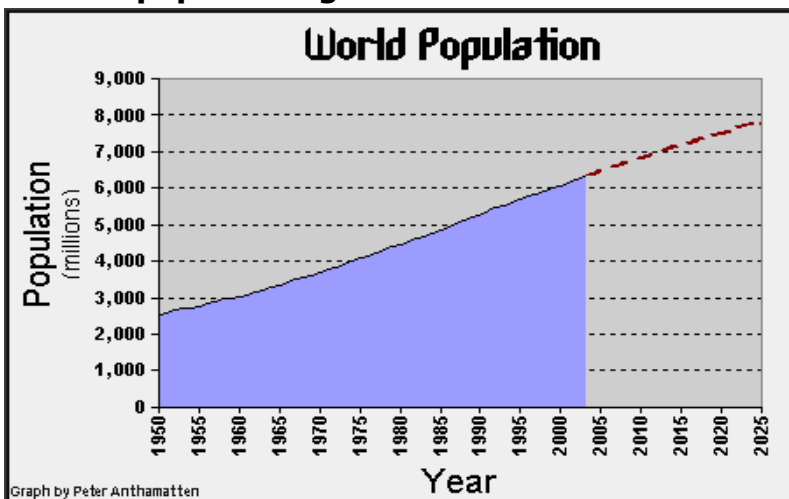


They interact with each other to form a predator prey mechanism (see figure).

Predators can be used to control pests in ***Biological pest control***.

Prey try to out do the predator by :- camouflage, mimicry, being fast, moving in numbers  
 Predators improve their catch by :- catching weak individuals, hunting in groups, being fast.

### **Human population growth**



The World's population has increased dramatically in the past several hundred years.

The population really started growing with the Industrial Revolution.

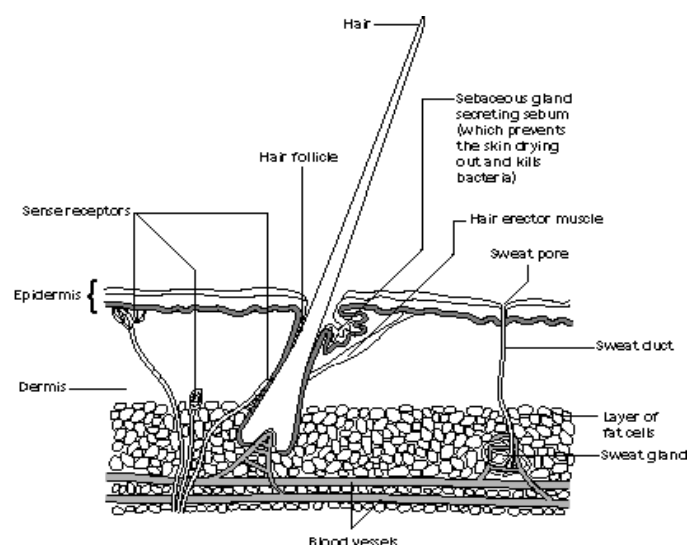
Human technology and population growth can directly and indirectly disturb the biosphere.

### ***The Skin***

The skin is made up of mainly 2 layers – outer epidermis and inner dermis

Epidermis is divided into 3 layers

- 1 Cornified layer – dead cells. Topmost layer
- 2 Granular layer - cells here have been produced by the malpighian layer
- 3 Malpighian layer – innermost layer. Some cells contain melanin. Produces new cells.



The dermis contains connective tissue, capillaries, sensory nerve endings, lymphatics, sweat glands and hair follicles.