

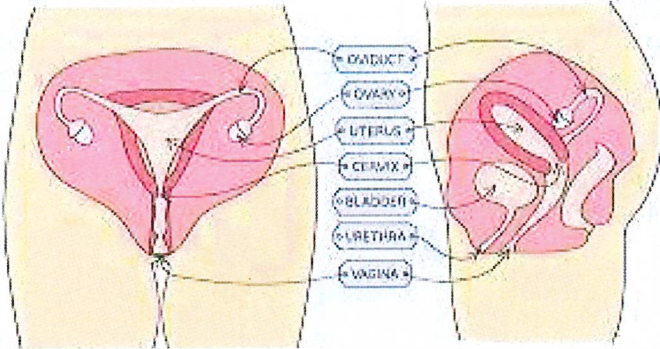
Reproduction

Threshold Concept

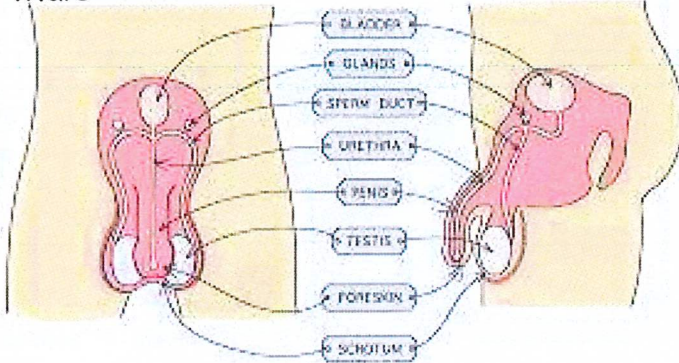
Reproduction can happen sexually and asexually

Reproductive organs

Female



Male

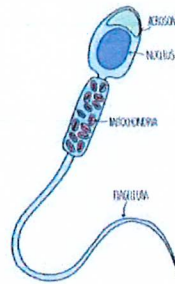


Keywords

- **Sperm:** male reproductive cell that contains genetic material
- **Egg:** female reproductive cell that contains genetic material
- **Reproduction:** the joining of sex cells (a sperm and egg) to produce offspring
- **Fertilisation:** the joining of a male and female sex cell/genetic material
- **Develop:** build upon given information

Sperm cell

Adaptations

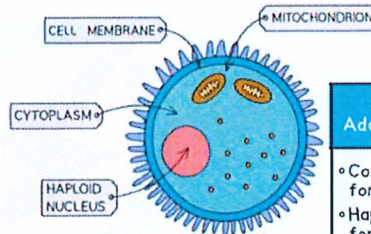


- The head contains the genetic material for fertilisation in a haploid nucleus (containing half the normal number of chromosomes)
- The acrosome in the head contains digestive enzymes so that a sperm can penetrate an egg
- The mid-piece is packed with mitochondria to release energy needed to swim and fertilise the egg
- The tail enables the sperm to swim



Egg cell

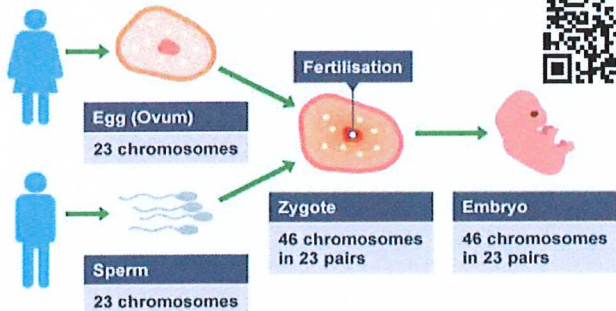
Adaptations



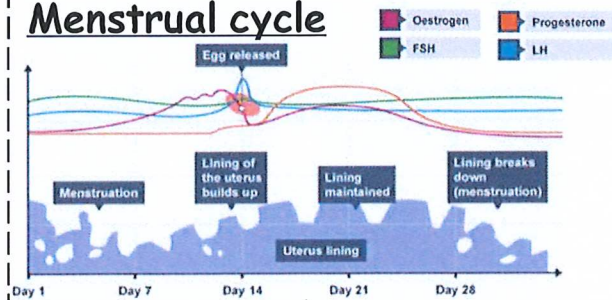
- Contains a lot of cytoplasm which has nutrients for the growth of the early embryo
- Haploid nucleus contains the genetic material for fertilisation
- Cell membrane changes after fertilisation by a single sperm so that no more sperm can enter

Fertilisation

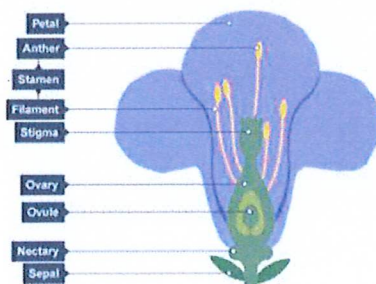
When the sperm and egg nuclei join, they form a ZYGOTE



Menstrual cycle



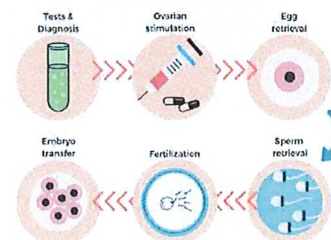
Plant structures



IVF

In Vitro Fertilisation is used to help people with fertility issues conceive

IVF PROCESS



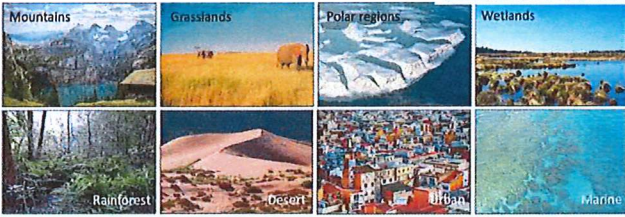
Equations for this topic

Ecology

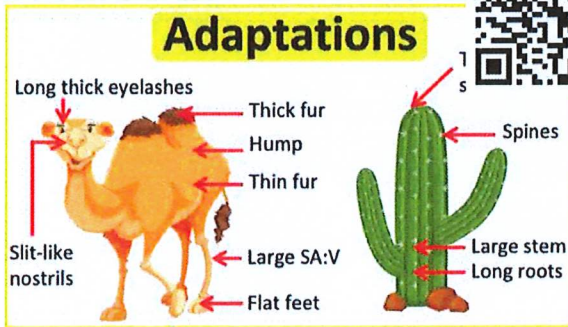
Threshold Concept

Understand that living things interact with the world around them

Different Habitat- An area where an organism is at home



Adaptations



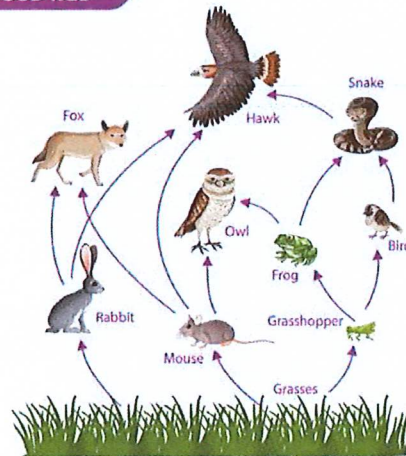
Keywords

- Living - Undertaking the seven processes of living things
- Changes - structural, physiological and behavioural changes that allow species to compete
- Animal - Living creature of one of seven domains
- Plant - Living tissue that is a producer
- Energy - The flow through all organisms and food chains

Food Chains/Webs - show the flow of energy

FOOD WEB

BYJU'S



Abiotic and Biotic Factors

Biotic factors	Abiotic factors
Living factors that affect another organism or shapes the environment.	Non-living factors that affect organisms.
<ul style="list-style-type: none"> ✓ Predation ✓ Food availability ✓ Competition ✓ Disease 	<ul style="list-style-type: none"> ✓ Temperature ✓ Light intensity ✓ Water ✓ Soil PH & mineral content ✓ Gases

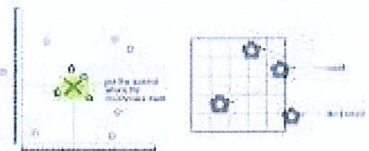


Required practical



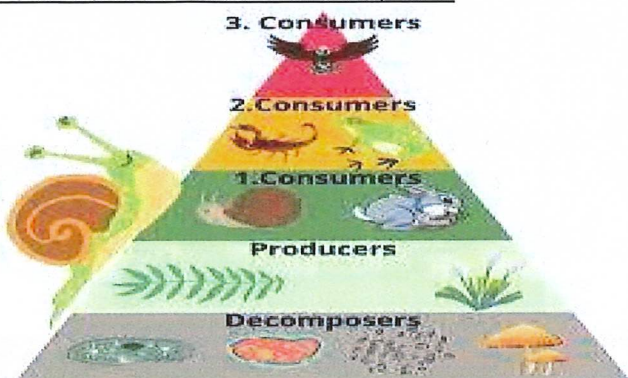
Quadrats

1. Measure area and form a grid
2. Take 2 random numbers and use these as coordinates on your grid
3. Lay your quadrat down
4. Count the number of a species and record results



- Must be **random** assignment of grids
- The **bigger** the sample the better (**validity**)

Producers and Consumers



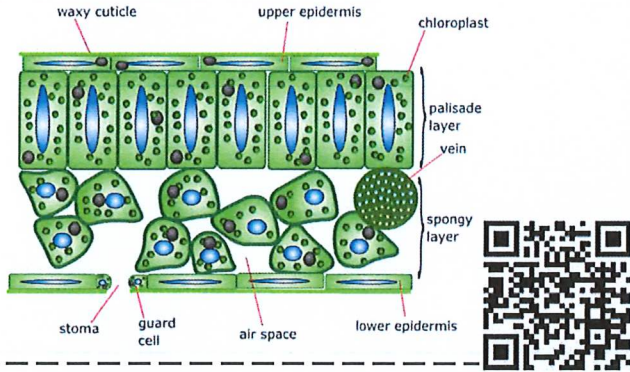
Equations for this topic

Bioenergetics

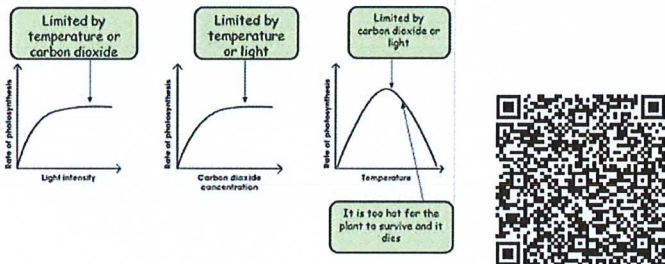
Threshold Concept

Respiration and photosynthesis are chemical processes that provide plants and animals with energy.

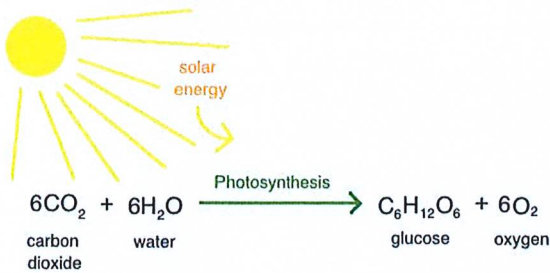
Structure of the leaf



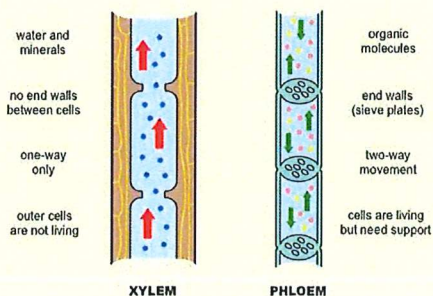
Limiting factors of photosynthesis



Photosynthesis



Xylem and Phloem

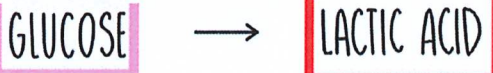
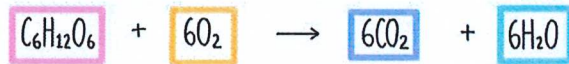


Keywords

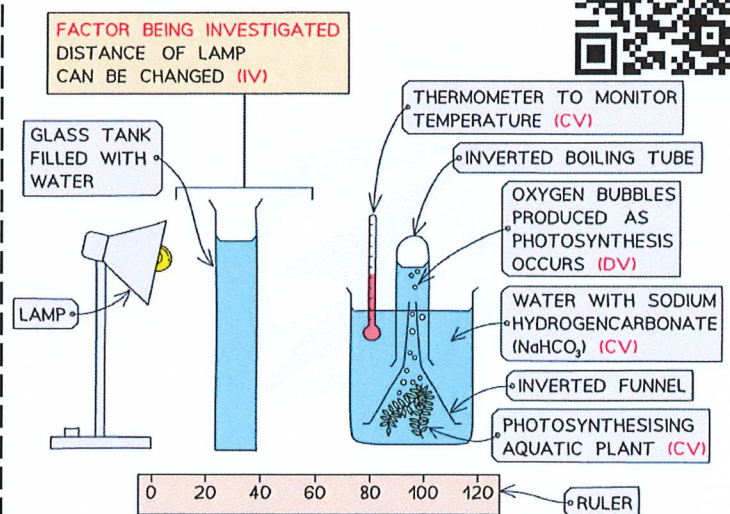
- **Respiration:** Respiration is the body's way of producing energy from the food we eat. It involves the breakdown of glucose in the presence of oxygen into carbon dioxide and water with the release of energy-generating molecules called ATP.
- **Photosynthesis:** is a chemical reaction that takes place in the chloroplasts of green plant cells, where light energy is used to convert carbon dioxide and water into glucose and oxygen.
- **Energy:** The ability to do work
- **Limiting factors:** Limiting factors affect the rate of a reaction. A limiting factor is a condition, that when in shortage, slows down the rate of a reaction.
- **Reaction:** A chemical reaction is when one or more substances change and produce one or more new chemical substances.



Respiration



Required practical



Equations for this topic

$$\text{REACTION RATE} = \frac{\text{CHANGE IN MASS OF REACTANT OR PRODUCT}}{\text{TIME}}$$

Infection and response

Threshold Concept

Pathogens are microorganisms that cause disease

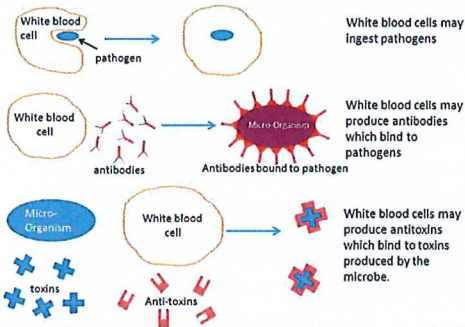
Communicable and non-communicable disease:

- Communicable, which can be transferred from one person to another, or from one organism to another, eg in humans, these include measles, food poisoning and malaria
- Non-communicable, which are not transferred between people or other organisms



Fighting against disease

How white blood cells protect us from disease



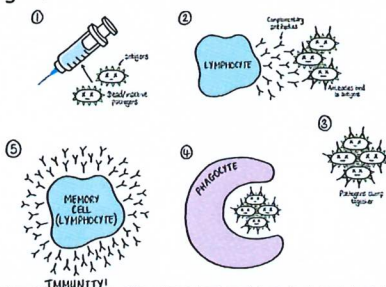
Antibiotics vs painkillers

- Antibiotics are substances that slow down or stop the growth of bacteria.
- Painkillers are chemicals that relieve the symptoms but do not kill the pathogens.



Vaccinations

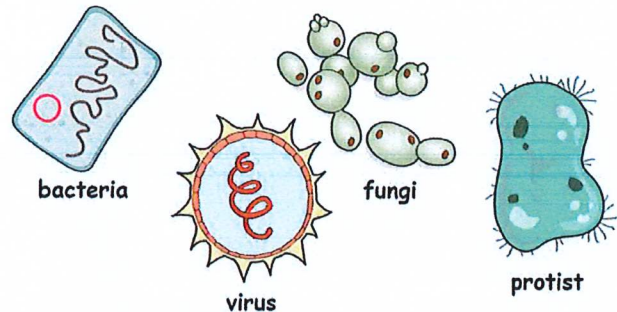
Vaccines allow a dead or altered form of the disease causing pathogen to be introduced into the body, which contain a specific antigen.



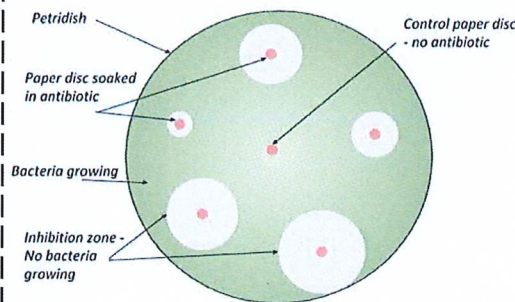
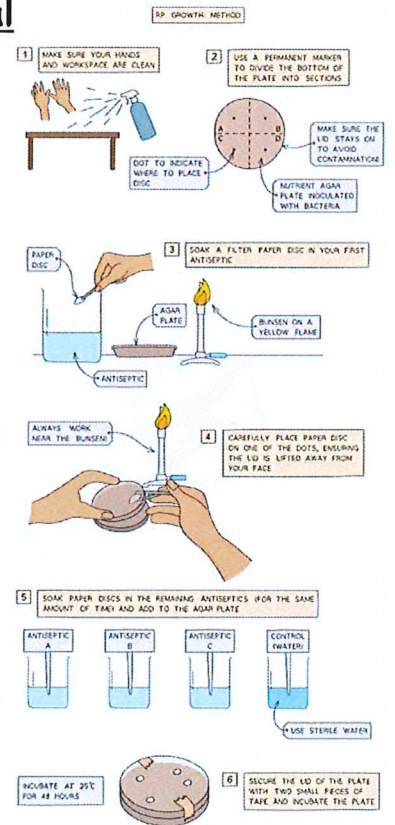
Keywords

- **Pathogens:** A microorganism that causes disease e.g. bacteria, virus, protist, fungus.
- **Microorganism:** Are so small they can only be seen using a microscope.
- **Virus:** A disease causing agent about 1/100th of the size of a bacterial cell. Can only replicate within host body cell/
- **Bacteria:** A single celled microorganism without a true nucleus, some cause disease.
- **Fungi:** A microorganism that can cause disease, and that produces spores that can spread to other organisms.

Pathogens



Required practical



Equations for this topic