Biology

Active transport

- Movement of molecules from lower concentration to higher concentration against the gradient using energy is called active transport
- Example is plants and human
- in plants root hair cell absorbs the minerals and water from the soil using ATP
- In humans glucose taken in from the gut and kidney tubules using ATP

Exchanging substances

Single cell organisms

Large surface area and gases easily diffuse in and out of the cell membrane

Multicellular organisms

- It has small surface area compared to their volume and they cannot diffuse gases faster
- They need special gas exchange

Features of effective exchange surfaces

- Thin membrane that means short distance for diffusion

- It has large surface area and more substances can diffuse
- Good blood supply in animals and then substances can move in an out of the blood
- Ventilation, air Movement in animal is there so there is faster gas exchange

Gas exchange in lungs

- Lung transfer oxygen into the blood and remove the carbon dioxide
- It is done in tiny sacs called alveoli
- It is very thin wall which leads to quick diffusion
- it has moist Linings that make the gas dissolve easily
- it has rich blood

Gas exchange in small intestine

- Inner surface has a tiny structure is called villi

Villi features

- Single layer of cells means short diffusion path
- large surface area means faster diffusion

Gas exchange in fish gills

- Fish take water through the mouth then oxygen diffuses into the blood and carbon dioxide will come out

- Gills have many filaments means large surface area
- Filaments contain lamellae means tiny plates
- Those tiny plates have large surface area
- they have network of capillary that's means faster diffusion

Gas exchange in plant leaves

- Carbon dioxide diffuses into the leaves for photosynthesis
- Leaf features are they have lower surface area and has tiny holes called stomata
- Guard cells control the stomata
- Latent leaf shaped means large surface area
- Cell walls inside leaf means extra surface for diffusion inside leaves and there is much easier for gas exchange