

Biology GCSE

Note- In all the symbol equations the numbers should be smaller than the letters.

Yeast cell -

no cellulose in cell wall

Contains a loop of DNA/ strand free from the cytoplasm

O₂ is present yeast respire aerobically (produces O₂)

O₂ isn't present yeast respire anaerobically (by fermentation)

Bacteria cell -

Single celled organism

May release poisons called TOXINS that make us feel ill.

Divide rapidly by splitting into (binary fission)

No nucleus

No mitochondria

Contains plasmids (loop of DNA)

No cellulose in cell walls

Diffusion - the movement of particles from a high concentration gradient to a low concentration gradient. The movement is random and they never stop moving around. The greater the concentration difference the steeper the concentration gradient, factors that can affect diffusion are higher temperature, shorter distance of diffusion and steeper gradient. Living organisms use diffusion when O₂ goes from the alveoli in the lungs into the blood and CO₂ goes from the blood in the lungs into the alveoli.

Osmosis - the specific type of diffusion which is the movement of water molecules from a high concentration gradient to a low concentration gradient. The water molecules are small enough to pass through the partially permeable membrane whereas salts and sugars are too big. The movement is from a dilute solution to a concentrated solution.

Dilute solution in a cell means the cell becomes turgid.

Concentrated solution means the cell becomes flaccid and soft

Plasmolysed cell means the cytoplasm had pulled away from the cell wall. The plant will wilt.

your lungs are highly specialised for exchanging gases.

Adaptations for efficient gas exchange:

- Very large surface area for diffusion
- good blood supply + good O₂ supply = maintains a large concentration gradient
- thin permeable walls = short diffusion pathway.

Positive pressure ventilator - forces air into the lungs at a sufficient force to expand the chest and lungs.

Negative pressure ventilator - (iron lung) when air is pumped back into the iron lung, the pressure inside increases causing air to move out of the lungs.

Advantages and disadvantages of a positive pressure ventilator to a negative pressure ventilator:

More freedom of movement for patients, portable and does not affect blood flow in lower body.

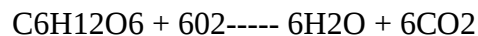
Disadvantages are the tube in the trachea is uncomfortable making it more difficult to eat and talk.

Respiration - releases energy through pumping blood containing O₂ to muscle cells and getting rid of CO₂ as they respire.

Aerobic respiration

- complete break down of glucose --- releases large amounts of energy.
- requires the presence of oxygen.
- chemical reaction that occurs in mitochondria.

Glucose + oxygen ----- water + carbon dioxide (+energy)



Takes place in the mitochondria

Cells that are very active (require a lot of energy) contain lots of mitochondria/ muscle cells

Space

Water availability

Factors that affect how animals grow:

Temp

Water

Nesting sites/shelter

Monitoring the distribution of organisms

The distribution of an organism is where an organism is found (e.g part of the playing field)

An organism might be more common in one area than another due to differences in environmental factors between the two areas.

For example daisies may be more common in the open than under trees because there's more light available in the open.

2 methods: - give quantitative data about the distribution.

Measure how common an organism is in two different areas and compare them.

Study how the distribution changes across an area.

Place randomly a 1m squared quadrat with the first sample area and count all the organisms within the quadrat.

Work out population size:

Work out mean number of organisms per m squared.

Multiple mean by total area of the habitat

Eg 800m squared and there are 22 daisies per m squared then the size of the daisy population is $22 \times 800 = 17\,600$.

Mean = total number of organisms

by the total number of quadrats.

Viruses reproduce inside cells so are difficult to kill without damaging tissues.

Changing pathogens - to a new strain

The new strain may be resistant to:

-Antibiotics

-Vaccinations

The new strain will spread rapidly because:

-no effective treatment

-people are not immune

Antigen changes shape (different protein)

No memory cells

Slower immune response- cannot make the correct antibody quick enough

Pathogen multiplies

Releases toxins

ill

Resistance to antibiotics:

Overuse --- used to treat non-serious infections

Inappropriate use-- farm animals to increase growth.

Patients not completing the dose -- not all pathogens are killed.

Antigens- unique proteins on the surface of pathogens.

WBC's make antibodies to attack and destroy these antigens.

Vaccinations - active artificial immunity