OCR (A) Biology GCSE

B2.2 - The challenges of size

Flashcards

Why do large multicellular organisms need transport systems?

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They have a small surface area to volume ratio and so the rate of diffusion alone would not be fast enough to transport substances around

Give 4 examples of substances transported within organisms

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- Oxygen is transported in for respiration
- CO_2 is transported out from respiration
- Dissolved food molecules from digestion
- Urea and waste products

Why do mammals need a double circulatory system?

Why do mammals need a double circulatory system?

Double circulatory systems have blood at a higher pressure, allowing it to flow faster and move substances quickly around the body

Describe the double circulatory system in mammals

Describe the double circulatory system in mammals

The heart pumps blood to the lungs, the oxygenated blood returns to the heart and is then pumped around the body

What is the difference in function between veins, arteries and capillaries?

What is the difference in function between veins, arteries and capillaries?

Arteries carry blood **a**way from the heart

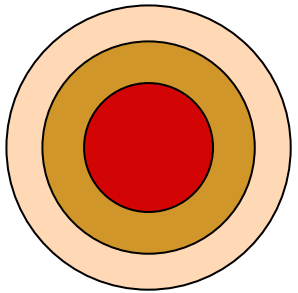
Ve**in**s carry blood towards (**in**to) the heart

Capillaries flow close to tissues for exchange

Describe the structure of arteries

Describe the structure of arteries

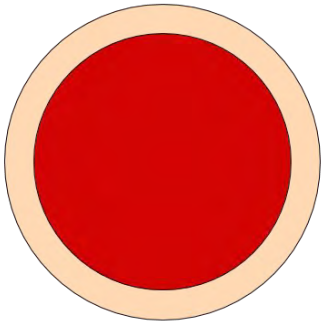
They have thick walls made of muscle and elastic tissue and a small lumen to transport blood under high pressure



Describe the structure of capillaries

Describe the structure of capillaries

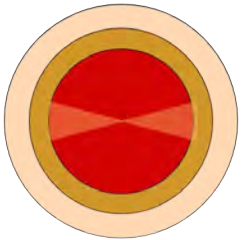
They have thin walls about one cell thick to allow for the easy exchange of substances at the tissues.



Describe the structure of veins

Describe the structure of veins

Veins have less muscle and elastic tissue than arteries and they have a larger lumen as the blood is at lower pressure, they also have valves to prevent backflow



Describe the structure of the lungs

Describe the structure of the lungs

- The trachea branches into two bronchi
- The bronchi branch into bronchioles
- These bronchioles end in alveoli which are lined with capillaries for exchange

Describe the blood flow through the right side of the heart

Describe the blood flow through the right side of the heart

- Deoxygenated blood flows into the right atrium from the vena cava
- This blood passes through the right AV valve into the right ventricle
- The blood is then pumped out of the heart to the lungs through the right SL valve and into the pulmonary artery

Describe the blood flow through the left side of the heart

Describe the blood flow through the left side of the heart

- Blood enters into the left atrium from the pulmonary vein
- The blood is then pumped through the left AV valve into the left ventricle
- The blood is then pumped out through the left SL valve and into the aorta

What is the name of the wall that separates the right and left sides of the heart?

What is the name of the wall that separates the right and left sides of the heart?

The septum

What is the name of the artery that supplies the heart tissue with blood?

What is the name of the artery that supplies the heart tissue with blood?

The coronary artery

What type of muscle is the heart made of?

What type of muscle is the heart made of?

Cardiac muscle

Why is the wall of the left ventricle thicker than the wall of the right ventricle?

Why is the wall of the left ventricle thicker than the wall of the right ventricle?

The left ventricle has to pump blood a further distance around the whole body so the blood needs to be under a higher pressure

How is plasma adapted as a transport medium?

How is plasma adapted as a transport medium?

Plasma is the liquid part of the blood and most molecules transported in blood need to be dissolved in water

Give 3 adaptations of red blood cells to their function

Give 3 adaptations of red blood cells to their function

- They have a biconcave shape which gives them a large surface area
- They have no nucleus so there is more space for haemoglobin
- They are very flexible so they can fit through capillaries

How are root hair cells adapted to their function?

How are root hair cells adapted to their function?

- Long root hair extension to increase surface area for uptake
- Thin membranes to decrease the diffusion distance

What does the xylem transport?

What does the xylem transport?

Water and minerals

State 3 benefits of transpiration

State 3 benefits of transpiration

- The stream of water cools the plant
- The water helps to support the plant by creating turgor pressure
- The plant has a constant water supply for photosynthesis

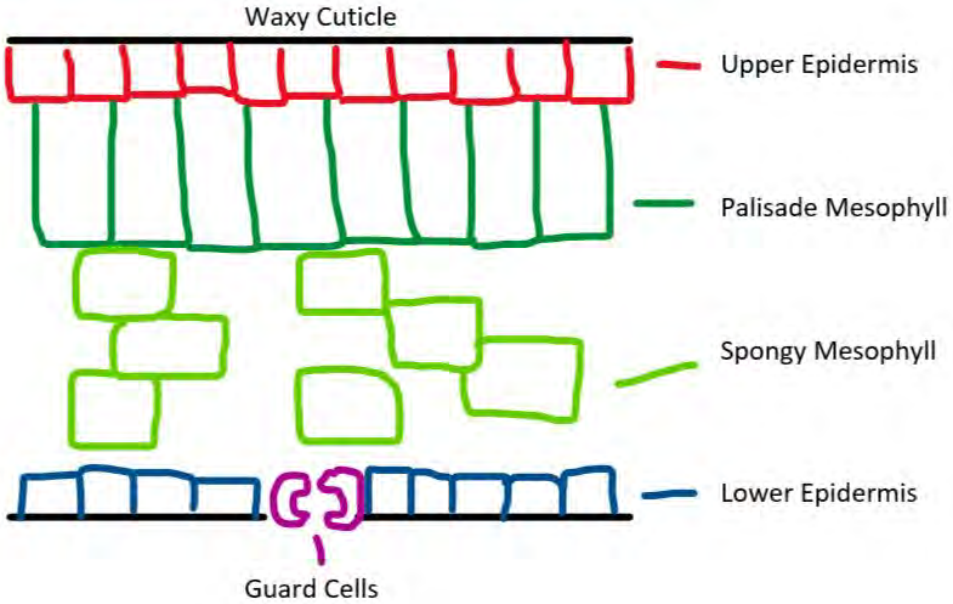
How is the xylem adapted to transport water?

How is the xylem adapted to transport water?

- It is waterproofed using a substance called lignin
- The xylem cells are dead and have no organelles so there is more space for water

Describe the structure of leaf tissue

Describe the structure of leaf tissue



Describe the process of transpiration

Describe the process of transpiration

- Water is lost through the stomata
- More water is drawn up to replace the lost water

What is the transpiration stream?

What is the transpiration stream?

The transpiration stream is the flow of water through a plant

How does temperature affect the rate of transpiration?

How does temperature affect the rate of transpiration?

- As the temperature increases, so does the transpiration rate
- The molecules have more KE and evaporation happens faster

How does light intensity affect the rate of transpiration?

How does light intensity affect the rate of transpiration?

- The brighter the light, the more stomata are open and the rate of photosynthesis increases which both decrease the amount of water in the plant
- The rate of transpiration increases

How does the wind speed affect the rate of transpiration?

How does the wind speed affect the rate of transpiration?

- The faster the wind speed, the faster the water is moved away from the plant, creating a steeper gradient and increasing the transpiration rate

Describe how to use a potometer to measure transpiration

Describe how to use a potometer to measure transpiration

- The plant is placed in the end of an airtight tube containing water
- A single air bubble is introduced to the tube and the movement of the bubble is measured over time

What does the phloem transport?

What does the phloem transport?

Sugars like sucrose

Describe translocation

Describe translocation

- Translocation is the movement of sugars up or down the phloem from source to sink (with the use of energy)