

Biology Section 3.2: Transport Systems in Animals and Plants

Circulatory System — The Heart

- That the circulatory system transports materials around the body.
- That humans have a double circulatory system — one circuit transports blood between the heart and the lungs, and the other transports blood between the heart and the rest of the body.
- That the heart is the organ which pumps blood around the body.
- That the walls of the heart are mainly made of muscle tissue.
- That the four chambers of the heart are called the right atrium, right ventricle, left atrium and left ventricle
- That the vena cava, pulmonary artery, aorta and pulmonary vein are the four major blood vessels associated with the heart.
- That the heart has valves so blood doesn't flow in the wrong direction.
- That blood flows into the atria through veins (the vena cava and the pulmonary vein), and is then forced into the ventricles when the atria contract. It is then forced out of the heart through arteries (the pulmonary artery and the aorta) when the ventricles contract.

Circulatory System — The Blood Vessels

- That blood is carried away from the heart in arteries, which have thick walls containing muscle and elastic fibres.
- That blood is carried close to the cells of the body in capillaries and that substances are exchanged between the cells of the body and the blood by passing through the walls of these capillaries.
- That capillaries are very narrow and have thin, permeable walls.
- That blood returns to the heart in veins, which have thinner walls than arteries and often have valves to prevent blood from flowing in the wrong direction.

Circulatory System — The Blood

- That blood is a tissue and its main components are red and white blood cells, platelets and plasma.
- That red blood cells contain haemoglobin (a red pigment), don't have a nucleus and carry oxygen from the lungs to all the cells in the body.
- That oxyhaemoglobin is formed in the blood at the lungs when oxygen combines with haemoglobin, and that oxyhaemoglobin splits back into oxygen and haemoglobin at body cells.
- That white blood cells have a nucleus and help to defend the body against disease caused by microorganisms.
- That platelets are fragments of cells, don't have a nucleus and help blood to clot at a wound.
- That plasma carries just about everything in the blood including the soluble products of digestion (from the gut to the cells of the body), carbon dioxide (from the organs to the lungs), and urea (from the liver to the kidneys).

Circulation Aids

- That artificial hearts and heart valves are mechanical devices that can be used to treat someone with heart failure or whose valves don't work properly.
- Some of the advantages and disadvantages of artificial hearts and heart valves, so you can evaluate their use.
- That stents are mesh tubes that are inserted into narrowed arteries (often coronary arteries) to widen them and keep them open.
- Some of the pros and cons of stents, so you can evaluate their use.
- How to evaluate data on the production and use of artificial blood products.

Transport of Substances in Plants

- That flowering plants have two separate transport systems (made of phloem tissue and xylem tissue).
- That phloem tubes transport dissolved sugars from the leaves to other parts of the plant, such as growing regions and storage organs.
- That xylem tubes transport water and mineral ions from the roots of a plant to the stem and leaves.
- That in the transpiration stream, water is moved from a plant's roots, up the xylem and out of the leaves.