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## Circulatory system

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### Summary

- The circulatory system delivers oxygen and nutrients to cells and takes away wastes.
  - The heart pumps oxygenated and deoxygenated blood on different sides.
  - The types of blood vessels include arteries, capillaries and veins.
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All cells in the body need to have oxygen and nutrients, and they need their wastes removed. These are the main roles of the circulatory system. The heart, blood and blood vessels work together to service the cells of the body. Using the network of arteries, veins and capillaries, blood carries carbon dioxide to the lungs (for exhalation) and picks up oxygen. From the small intestine, the blood gathers food nutrients and delivers them to every cell.

### Blood

Blood consists of:

- **Red blood cells** – to carry oxygen
- **White blood cells** – that make up part of the immune system
- **Platelets** – needed for clotting
- **Plasma** – blood cells, nutrients and wastes float in this liquid.

### The heart

The heart pumps blood around the body. It sits inside the chest, in front of the lungs and slightly to the left side. The heart is actually a double pump made up of four chambers, with the flow of blood going in one direction due to the presence of the heart valves. The contractions of the chambers make the sound of heartbeats.

### The right side of the heart

The right upper chamber (atrium) takes in deoxygenated blood that is loaded with carbon dioxide. The blood is squeezed down into the right lower chamber (ventricle) and taken by an artery to the lungs where the carbon dioxide is replaced with oxygen.

### The left side of the heart

The oxygenated blood travels back to the heart, this time entering the left upper chamber (atrium). It is pumped into the left lower chamber (ventricle) and then into the aorta (an artery). The blood starts its journey around the body once more.

### Blood vessels

Blood vessels have a range of different sizes and structures, depending on their role in the body.

### Arteries

Oxygenated blood is pumped from the heart along arteries, which are muscular. Arteries divide like tree branches until they are slender. The largest artery is the aorta, which connects to the heart and picks up oxygenated blood from the left ventricle. The only artery that picks up deoxygenated blood is the pulmonary artery, which runs between the heart and lungs.

### Capillaries

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The arteries eventually divide down into the smallest blood vessel, the capillary. Capillaries are so small that blood cells can only move through them one at a time. Oxygen and food nutrients pass from these capillaries to the cells. Capillaries are also connected to veins, so wastes from the cells can be transferred to the blood.

## Veins

Veins have one-way valves instead of muscles, to stop blood from running back the wrong way. Generally, veins carry deoxygenated blood from the body to the heart, where it can be sent to the lungs. The exception is the network of pulmonary veins, which take oxygenated blood from the lungs to the heart.

## Blood pressure

Blood pressure refers to the amount of pressure inside the circulatory system as the blood is pumped around.

## Common problems

Some common problems of the circulatory system include:

- **Aneurysm** – a weak spot in the wall of an artery
- **Atherosclerosis** – a narrowing of the arteries caused by plaque deposits
- **Heart disease** – lack of blood supply to the heart because of narrowed arteries
- **High blood pressure** – can be caused by obesity (among other things)
- **Varicose veins** – problems with the valves that stop blood from running backwards.

## Where to get help

- Your doctor
- In an emergency, always call triple zero (000)

## Things to remember

- The circulatory system delivers oxygen and nutrients to cells and takes away wastes.
- The heart pumps oxygenated and deoxygenated blood on different sides.
- The types of blood vessels include arteries, capillaries and veins.

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