

Circulatory systems

Define the circulatory system.

Circulatory systems **Supplement**

Describe the single circulation of a fish.

Circulatory systems **Supplement**

Describe the double circulation of a mammal.

Circulatory systems **Supplement**

Advantages of a double circulation?

The heart

Name the structures of the mammalian heart.

The heart

Which vessels carry blood away from, and to, the heart?

The heart **Supplement**

Where are the atrioventricular and semilunar valves?

The heart **Supplement**

Why is the septum important?

Heart to gills to body and back to the heart.
Blood passes through the heart once per circuit.

A system of blood vessels with a pump and valves to ensure one-way flow of blood.

Blood is pumped again after the lungs, so reaches the body at high pressure while lung pressure stays lower.

Right side of heart to lungs and back to left side; left side to body and back to right side.
Two circuits.

Arteries carry blood away from the heart; veins return it to the heart.

Muscular wall, septum, left and right ventricles, left and right atria, one-way valves, coronary arteries.

It separates oxygenated and deoxygenated blood so they do not mix.

Atrioventricular: between atria and ventricles. Semilunar: at the start of the aorta and pulmonary artery.

The heart **Supplement**

Why is the left ventricle wall thicker than the right?

The heart **Supplement**

Why are the atria walls thinner than the ventricle walls?

The heart **Supplement**

What happens to the valves when the ventricles contract?

The heart

Three ways to monitor the heart?

The heart

How do you calculate heart rate from a 15-second pulse count?

The heart

Effect of exercise on heart rate?

The heart **Supplement**

Why does heart rate rise during exercise?

The heart

What is coronary heart disease?

Atria push blood only a short distance into the ventricles.

It pumps blood to the whole body at high pressure; the right pumps only to the lungs.

ECG, pulse rate and listening to the sounds of the valves closing.

Atrioventricular valves close and semilunar valves open, so blood leaves through the arteries.

Heart rate increases during exercise and returns to the resting rate during recovery.

Multiply the number of beats by 4 to give beats per minute.

Blockage of the coronary arteries by fatty deposits, reducing blood flow to the heart muscle.

Muscles respire faster, so more oxygen and glucose are delivered and carbon dioxide is removed faster.

The heart

Risk factors for CHD?

The heart

How can diet and exercise reduce the risk of CHD?

Blood vessels

Artery: wall, lumen, valves?

Blood vessels

Vein: wall, lumen, valves?

Blood vessels

Function of capillaries?

Blood vessels **Supplement**

Why are artery walls thick?

Blood vessels **Supplement**

Capillary structure and function?

Blood vessels

Name the vessels to and from the heart.

Less saturated fat reduces fatty deposits;
exercise strengthens the heart and helps
control body mass.

Diet, lack of exercise, stress, smoking,
genetic predisposition, age and sex.

Thin wall, wide lumen, valves present.

Thick wall, narrow lumen, no valves.

Blood is at high pressure; thick muscular,
elastic walls withstand it.

Exchange of substances between the blood
and body cells.

Vena cava and pulmonary vein bring blood
in; aorta and pulmonary artery take blood
out.

Walls one cell thick and permeable, in a
large network, giving a short diffusion
distance.

Blood vessels

Name the vessels to and from the kidney.

Blood vessels **Supplement**

Name the main vessels of the liver.

Blood

List the components of blood.

Blood

How do red and white blood cells differ in appearance?

Blood

Function of red blood cells?

Blood

Functions of white blood cells and plasma?

Blood

Roles of blood clotting?

Blood **Supplement**

How to identify a lymphocyte and a phagocyte?

Hepatic artery, hepatic portal vein (from the gut) and hepatic veins.

Renal artery to the kidney; renal vein from the kidney.

Red cells have no nucleus and are pale in the middle; white cells have a stained nucleus.

Red blood cells, white blood cells, platelets and plasma.

White cells: phagocytosis and antibody production. Plasma: transports cells, ions, nutrients, urea, hormones and carbon dioxide.

Transport oxygen; haemoglobin combines with the oxygen.

Lymphocyte: large round nucleus.
Phagocyte: lobed nucleus.

Prevents blood loss and the entry of pathogens.

Functions of lymphocytes and phagocytes?

Describe the process of clotting.

Soluble fibrinogen is converted to insoluble fibrin, forming a mesh that traps red blood cells.

Lymphocytes produce antibodies; phagocytes engulf pathogens by phagocytosis.