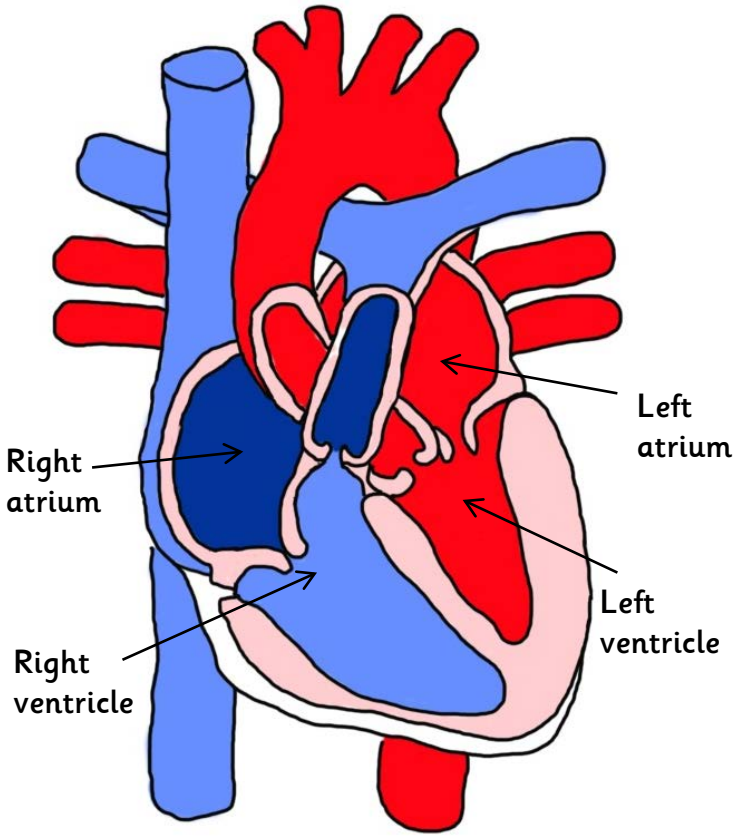
The Circulatory System

The circulatory system is a group of organs which transports blood and nutrients around the body. It consists of two circuits: the pulmonary circuit and the systemic circuit. The pulmonary circuit carries blood to the lungs to get oxygen and then back to the heart. The systemic circuit then carries the blood around the body to deliver the oxygen and return deoxygenated blood back to the heart.

The Heart

The heart is the organ responsible for pumping blood around the body. It is about the size of a clenched fist and is made up of four chambers. The human heart beats on average, sixty to ninety times per minute. Blood enters the right atrium of the heart and is emptied into the right ventricle (see diagram to the right). The right ventricle then pumps the blood to the lungs to collect oxygen and then travels to the left atrium. Next it is pushed into the left ventricle where it is pumped to the rest of the body via the aorta.

A diagram of the human heart



Blood Vessels

Arteries

Arteries are the blood vessels which carry oxygenated blood away from the heart. They have thick, muscular walls as they have to withstand high pressure.

Veins

Veins are the blood vessels which transport deoxygenated blood back to the heart. Veins have thinner walls as the blood travelling back to the heart is under low pressure. There are also valves in veins to prevent the blood from flowing backwards.

Capillaries

Capillaries are very small blood vessels which are only one cell thick. They are found in muscles and the lungs. They are responsible for delivering oxygen and nutrients to cells around the body therefore they need to be thin to allow these to pass through easliy.

Blood

Blood is the red coloured liquid that is pumped around the body. The average human adult has around five litres of blood in their body. Blood is made up of four different components which each perform a different function in the body.

Plasma

Plasma is the fluid part of blood. It makes up about 55% of the total blood volume. It is mostly made up of water as well as lots of other substances such as hormones, proteins and salts.

Red Blood Cells

Red blood cells carry the oxygen around the body. They contain a protein called haemoglobin which carries the oxygen. It is the interaction between the haemoglobin and oxygen that gives blood its bright red colour. Red blood cells are made in the bone marrow and usually last for around 120 days. Arteries have bright red blood in them because there's lots of oxygen present, whereas the blood in the veins is deoxygenated so it appears dark red (or blue when covered by skin).

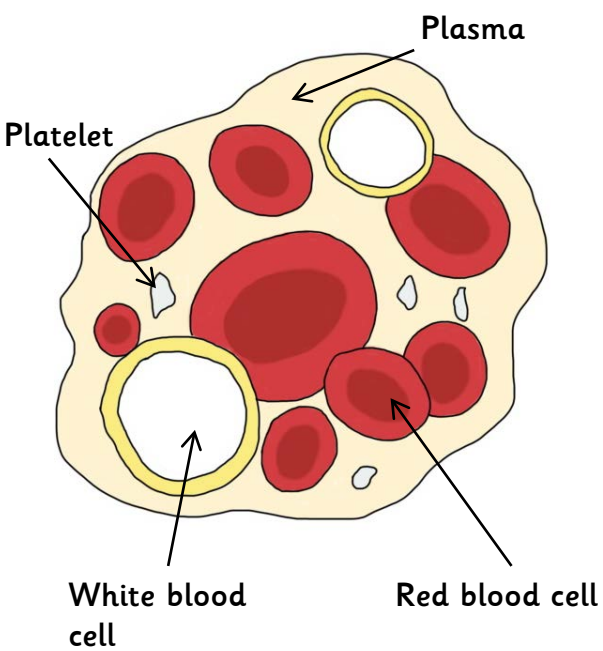
White Blood Cells

White blood cells play a big part in the body's immune system and help to fight off infection. They protect the body from germs, such as bacteria and viruses. Pus (the yellowish fluid often found at the site of an infection) is a collection of dead white blood cells.

Platelets

The purpose of the platelets is to help wounds heal. They clump together to form blood clots (known as a scab) which prevents further bleeding.

A diagram of the components of blood



Glossary

aorta – the largest artery in the human body
atrium – a blood chamber in the heart
bone marrow – the tissue inside bones where red blood cells are produced
deoxygenated – has no oxygen present
haemoglobin – the protein in red blood cells which carries oxygen
hormones – chemicals which help the body do certain things
immune system – different tissues that work together to protect the body from disease
oxygenated – contains oxygen
proteins – a chemical used in the body for building and repairing different parts of the body
valve – a device that opens and closes so that liquid only travels in one direction
ventricle – a blood chamber in the heart which pumps blood to other parts of the body

The Circulatory System – Follow-Up Work

Is this text fiction or non-fiction?

_____

What is the job of the pulmonary circuit?

_____

_____

Why do you think the writer compared the size of the heart to "a clenched fist?"

_____

_____

_____

What is the point of the diagram on the first page?

_____

_____

Find 2 adjectives that the that the writer used to describe the walls of arteries.

_____

What are the 4 different substances that make up blood?

_____

_____

What has the writer used to help find specific information quickly?

_____

Can you think of any infections that the white blood cells might help to fight off?

_____

_____

Can you find any of your veins? Why do they look blue?

What special punctuation did the writer use three times to give some extra information?

What has the writer used to help with some of the tricky vocabulary?

What do you notice about the way the words in the glossary are set out?

The Circulatory System – Vocab 1

Write down the meanings of these words which were highlighted in the text. Use a dictionary or Thesaurus to help you.

nutrients _____

organ _____

clenched _____

withstand _____

components _____

function _____

fluid _____

interaction _____

infection _____

bacteria _____

The Circulatory System – Vocab 2

Complete these sentences with the highlighted words below.

withstand infection clenched organ nutrients components

You need a balanced diet in order to get all the essential _____.

The tent couldn't _____ the stormy weather.

I had to get some antibiotics to clear my ear _____.

The most complex _____ in the human body is the brain.

The circuit had all the correct _____ yet it still didn't work.

She _____ her hands and shook her head.

Use these words to write your own paragraph about what you have learned.

function	fluid	infection	bacteria

The Circulatory System – SPAG

Brackets

Brackets are sometimes used in writing to give extra information, for example, *"Pus (the yellowish fluid often sound at the site of an infection) is a collection of dead white blood cells."*

Add some extra information to the following sentences inside the brackets.

Mr Johnson (_____) was not at school today.

Sam (_____) came to my house for tea.

My dog (_____) chased a cat down the road.

I watched my favourite film (_____) last night.

Put the brackets in the correct places in the following sentences:

- The diagram on the previous page shows how it should look.
- My brother the laziest boy in the world is still in bed!
- I lost my phone Samsung Galaxy at the cinema.
- The Tyrannosaurus rex a type of dinosaur was a fearsome predator.
- We visited Paris France on our holiday.

The Circulatory System – Oral Teacher Questions

Is this text fiction or non-fiction? Non-fiction

What is the job of the pulmonary circuit? To carry blood to the lungs and back to get oxygen.

Why do you think the writer compared the size of the heart to "a clenched fist?" The size of our clenched fist is a similar size and shape to our heart, therefore, it is a good example. The children may pick up on the fact that this will be true for each person depending on their size and age.

What is the point of the diagram on the first page? To help the reader picture the different parts of the heart and how the blood travels through them.

Find 2 adjectives that the writer used to describe the walls of arteries. Thick, muscular.

What are the 4 different substances that make up blood? Plasma, red blood cells, white blood cells and platelets.

What has the writer used to help find specific information quickly? Headings and subheadings.

Can you think of any infections that the white blood cells might help to fight off? Various possible answers: flu, chicken pox, tonsillitis, a cut or wound.

Can you find any of your veins? Why do they look blue? Veins have deoxygenated blood and so it is dark red. The dark red looks blue when covered by skin.

What special punctuation did the writer use three times to give some extra information? Brackets.

What has the writer used to help with some of the tricky vocabulary? A glossary.

What do you notice about the way the words in the glossary are set out? They are in alphabetical order.

The Circulatory System – Vocab 1

Write down the meanings of these words which were highlighted in the text. Use a dictionary or Thesaurus to help you.

nutrients – substances in food that the body can use to grow and survive

organ – a part of the body that performs an important job like the brain or heart

clenched – held tightly

withstand – stand up to, cope with

components – parts of something

function – job, purpose

fluid – liquid, a substance that flows

interaction – when two or more things react with one another

infection – what happens when germs enter the body and cause a disease

bacteria – a type of germ

The Circulatory System – Vocab 2

Complete these sentences with the highlighted words below.

withstand infection clenched organ nutrients components

You need a balanced diet in order to get all the essential nutrients.

The tent couldn't withstand the stormy weather.

I had to get some antibiotics to clear my ear infection.

The most complex organ in the human body is the brain.

The circuit had all the correct components yet it still didn't work.

She clenched her hands and shook her head.

Use these words to write your own paragraph about what you have learned.

function	fluid	infection	bacteria

Pupil's own answer. The paragraph must make sense and correlate with the text.

The Circulatory System – SPAG

Brackets

Brackets are sometimes used in writing to give extra information. *"Pus (the yellowish fluid often sound at the site of an infection) is a collection of dead white blood cells."* Add some extra information to the following sentences inside the brackets.

Mr Johnson (e.g. the music teacher) was not at school today.

Sam (e.g. a boy from school) came to my house for tea.

My dog (e.g. a black Labrador) chased a cat down the road.

I watched my favourite film (e.g. Toy Story) last night.

Put the brackets in the correct places in the following sentences:

- The diagram (on the previous page) shows how it should look.
- My brother (the laziest boy in the world) is still in bed!
- I lost my phone (Samsung Galaxy) at the cinema.
- The Tyrannosaurus rex (a type of dinosaur) was a fearsome predator.
- We visited Paris (France) on our holiday.