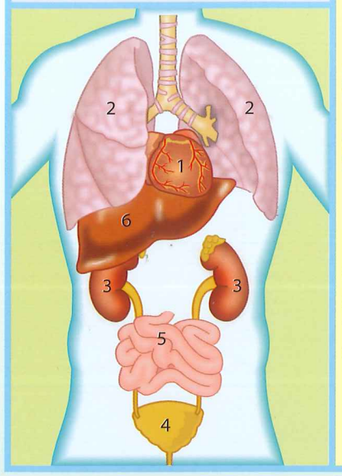
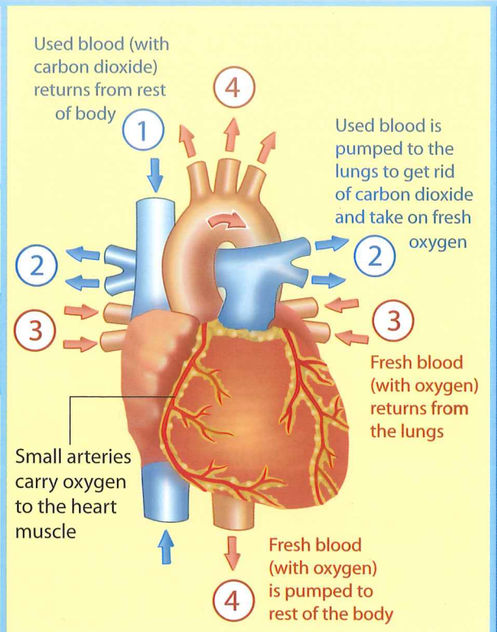
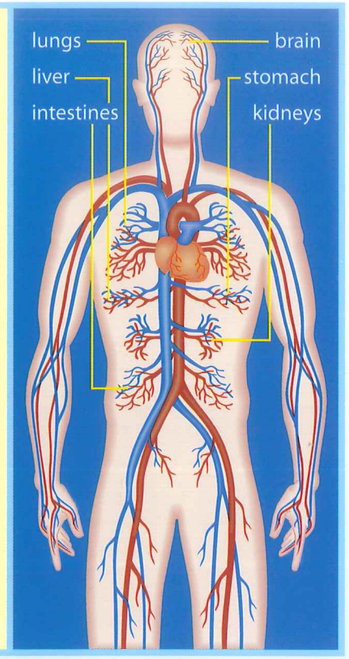
1 **HEART**: pumps blood around body
2 **LUNGS**: takes carbon dioxide from blood and recharges it with oxygen
3 **KIDNEYS**: filter waste from blood
4 **BLADDER**: stores liquid waste from kidneys before urination
5 **INTESTINES**: nutrients taken from food are passed into bloodstream
6 **LIVER**: converts nutrients for use by other cells







BLOOD

1 Our bodies are like machines that work on oxygen and fuel. We need to grow and repair ourselves as well as carry out everyday activities. To do all of this we breathe in air and eat food. But how do air and food get into all the different parts of our body where they are needed? Through our blood, of course.

An adult has about 4.7 litres of blood inside them, and a small child has half this amount. Generally, the bigger someone is the more blood they'll have, though this is not always the case.

2 Our bodies run on a circulatory system of arteries, veins and capillaries. Our heart is what keeps the blood pumping through at a regular rhythm. Adults have around 97,000 kilometres of arteries, veins and capillaries in their bodies - that's the equivalent of three times around the world!

The circulatory system was discovered by a British doctor, William Harvey, in the early 17th century. Since then, we have found out a lot more about how it works.

3 Circulation runs in two loops, like a figure 8. One loop carries oxygen-filled blood from the left side of the heart. This blood moves through arteries. When it has used its oxygen, the blood returns to the right side of the heart through veins. This is the second loop. The heart pumps blood from its right side, into the lungs, and then back into its left side to start the cycle again.

The blood goes out in arteries at a high pressure, and comes back to the heart in veins at a lower pressure. Capillaries take the blood between arteries and veins via tiny vessels that are only one cell thick. They operate as an 'exchange system'. While the blood is moving slowly through the capillaries, oxygen and food are released into the body and carbon dioxide and waste is collected and taken back to the heart.

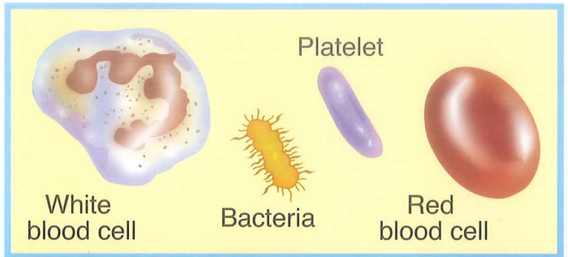
4 Other organs play their part too. The lungs supply the oxygen that is carried outwards. The kidneys keep the blood free of poisons and regulate salt and water. The liver and intestines help to supply the body with fuel from digested food.

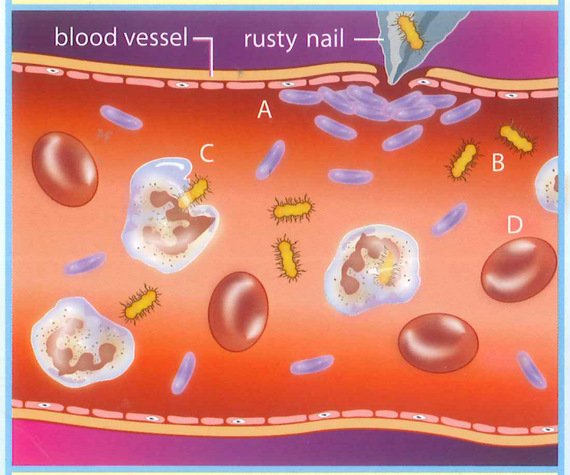
5 Blood inside our bodies is a dark purple-red colour, but when we cut ourselves the blood looks red because it changes colour when the oxygen mixes with it. If we bump ourselves, we often get a bruise that is caused by blood leaking from damaged vessels under the skin. The bruise changes colour as it heals.

6 We don't bleed to death when we get a cut because blood is able to clot and stop the flow. Clotting is caused by tiny elements, called platelets that come to the rescue and pile up to form a seal. Other blood elements join in and create a clot that eventually (if it's on the surface of the skin) forms a scab.

Some people have various types of diseases that interfere with the normal process of blood clotting. They have to be very careful not to get injured, or if they do, they must get help before they bleed to death.

7 In our blood we have both red and white blood cells. The red cells are in the majority, and their job is to carry oxygen and carbon dioxide.





A - Platelets seal wound
B - Bacteria enter blood stream
C - White blood cells attack bacteria
D - Red blood cells carry oxygen and carbon dioxide

They provide the energy and enzymes the body needs to work properly. A red blood cell lasts for about 120 days. We need to keep producing red cells at a good rate to stay healthy and energetic.

White blood cells protect the body against disease and infection. When we have an infection, more white cells are produced to help fight the illness. Some white cells "remember" how to make antibodies against particular germs or viruses, so next time they attack faster.

8 Both white and red blood cells are produced in our bone marrow, especially in the spine, ribs, pelvis, skull and breastbone. They travel around our body suspended in plasma. Plasma is the liquid part of our blood, and is a yellowish colour. It makes up about 55-65% of what is in our blood. All the jobs that our red and white cells do are made possible by plasma, which flows through the arteries and veins and carries the cells where they need to go. It also carries proteins, minerals and hormones.

9 Since blood travels throughout our body, it can pick up little "clues" from the different organs. These clues can be anything from antibodies to metals. Doctors can take your blood and test it, using these clues to work out what is wrong with you. This can be an effective tool for identifying illnesses.

Next time you feel your pulse on the underside of your wrist, think about all that blood pumping through you, all day, every day, and all the jobs it is doing on the way.

Questions

1 The bigger someone is
- a the more blood they might have.
- b the smaller their heart might be.
- c the less blood they might have.

2 The circulatory system supplies blood
- a just to the lungs.
- b just to the heart.
- c all around the body.

3 Capillaries are
- a used to make blood clots.
- b made in our bone marrow.
- c an exchange system between arteries and veins.

4 Which is not true about red blood cells?
- a They carry oxygen and carbon dioxide.
- b They provide energy and enzymes.
- c They protect against disease and infection.

5 What colour is not mentioned as being found in blood?
- a yellow
- b purple
- c blue

6 The kidneys
- a supply oxygen to the body.
- b use most of the body's blood.
- c regulate the amount of salt in the blood.

Vocabulary

Find words in the text that match the meanings below. The word is in the section shown in brackets.

7 The same or equal to (2)
8 A continuous round shape (3)
9 Finally (6)
10 Hints (9)
11 Recognising (9)

Grammar

The words in BLUE appear in the text. Match them by writing the correct antonym shown in RED.
E.g. under / over

12	different	risky
13	regular	similar
14	outwards	erratic
15	careful	inwards

Back To The Text...

16 Clots stop the flow of blood from wounds.
- a true
- b false

17 What would be a good sub-heading for section 5?
- a Outward Oxygen.
- b Changing Colours.

18 In which part of the library would you find this text?
- a fiction
- b non-fiction

Think About This

19 Look at the illustration on the front cover. The diagram on the left shows
- a the main organs in the body.
- b the body's circulatory system.

20 Look at the illustration on the front cover. The diagram in the centre shows the oxygen rich blood
- a in red.
- b in blue.

21 Two of the letters in the title are made up with
- a bacteria.
- b white blood cells.
- c platelets.
- d red blood cells.

22 Look at the illustration on page 2. It shows bacteria entering via
- a a knife wound.
- b a nail puncture.

23 Look at the illustration on page 2. One of the things it shows is
- a the white blood cells attacking bacteria.
- b the red blood cells attacking bacteria.

Challenge Option
Design: Blood Banks are important.
Design a Blood Bank Poster.