Human Body

Heart, Blood and Circulatory System
Heart

Your heart is a double pump with four chambers:

• the right atrium
• the left atrium
• the right ventricle
• the left ventricle

The septum, a strong wall, separates the right and left chambers which prevents the blood from mixing.

Each time your heart beats, there are two contractions:

1. Both the right and left atrium fill up with blood, which they get from different places, at the same time. Then they contract gently to move the blood down into your ventricles.

2. The ventricles contract powerfully to propel the blood to your lungs and the rest of your body.
Heart

How many chambers does your heart have? _____________________

What separates the right and left chambers of the heart?___________

When your heart beats, there are two contractions. What happens:

1. ________________________________________________________
   ________________________________________________________
   ________________________________________________________

2. ________________________________________________________
Heart

The sound that you hear, the lub-dup, is not actually your heart beating. It is the sound of the valves closing after every contraction.

The valves are like little doors that open and close at the right time to allow your blood to flow freely in the right direction.

Your heart has its own special blood vessels called the coronary arteries and veins. These are the vessels that carry oxygen to the heart and carry away the waste.

The pulmonary vein carries blood from the heart to the lungs while the pulmonary artery carries blood from the lungs back to the heart.

The aorta carries the blood from the heart to the body, while the venae cavae carry blood from the body back to the heart.

The pumping of your heart also assists in the delivery of chemical messengers called hormones and in the shuffling of germ-fighting cells from one battle to the next.
Heart

What is happening when you hear the lub-dup sound? ________________

_________________________________________

What do the coronary arteries and veins do? __________

_________________________________________

What does the pulmonary vein do? ______________________

_________________________________________

What does the aorta do? ___________________________

_________________________________________

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In a Heartbeat

1. The atria fill with blood.

2. The atria contract and the blood is forced through the valves and into the ventricles.

3. The ventricles contract when they are full and the valves shut causing the first 'lub' sound. The blood then rushed through the next valves into the blood vessels.

4. The second set of valves shut and makes the second sound, the 'dup'.
Heart

Your heart is a muscle about the same size as your fist. This organ can pump more than 5,678 litres of blood every day.

The heart has a protective outer layer called the pericardium which is held in place by strong fibres. These fibres are attached to the diaphragm and the breastbone. The pericardium produces a fluid that allows your heart to move smoothly.

The heart is an involuntary cardiac muscle.

What does this mean and why is it so important to have an involuntary cardiac muscle? _______________________

_______________________________________

_______________________________________

_______________________________________

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Heart

Humans are warm-blooded with an average body temperature of 37°C (98.6°F).

When you feel too hot, your heart pumps extra blood to your skin which makes your sweat allowing the heat to escape and your body to cool off.

When you start to feel cold, your heart pumps little blood to your skin which allows you to hold onto your body heat.

On average, a heart beats about 80 or 90 times a minute. Athletes and people who do lots of exercise have lower heart rates.

To check your heart beat, sit on a chair, find your pulse on your wrist or neck and count how many thumps you feel in a minute.

You can find your pulse by gently placing the index and middle fingers on your wrist or on the side of your neck. This pulse and is caused by the heart pumping blood along your arteries.
Heart

There are ways you can look after your heart:

• regular exercise
• eating a healthy, well-balanced diet
• no smoking

When you exercise, your muscles need more oxygen, so your heart has to pump harder. This increases your heart beat and helps make your heart stronger.

If you don’t look after your heart, you may have a heart attack.

A heart attack is caused by a blockage in the coronary blood vessels. Without fresh blood, this part of the heart may die and the heart stops beating properly.

Do you look after your heart properly? ______________

What else can you do to look after your heart? ________
Heart

Research the heart rate of each animal.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Heart Rate (Beats per Minute)</th>
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<tbody>
<tr>
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<td>Hummingbird</td>
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</table>

What did you find? ____________________________________________

_________________________________________________________________
Blood Cells

Blood is sometimes called ‘the liquid of life’ as it contains so many important ingredients that help your body.

Blood has four parts:
1. plasma
2. red blood cells
3. white blood cells
4. platelets

Plasma is the clear liquid that your blood cells float around in. Plasma is 95% water. Plasma contains nutrients, proteins, hormones and waste products.

Red blood cells are tiny discs that pick up oxygen and deliver it to all the cells in your body. They also carry carbon dioxide away.

White blood cells are your body’s defence system as they fight bacteria and viruses that make you sick.

Platelets are broken bits and pieces of cells which help stop the bleeding when you cut yourself. They clump themselves together, sticking to the broken blood vessel until the bleeding stops.

For every 15 white blood cells in your blood, you have about 250 platelets, and more than 5,000 red blood cells.
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Blood Cells

- plasma: deliver oxygen and take carbon dioxide away
- platelet: blood cells float in it
- red blood cells: fight bacteria and viruses
- white blood cells: clump together to stop the bleeding
Blood Cells

plasma

platelet

red blood cells

white blood cells

deliver oxygen and take carbon dioxide away

blood cells float in it

fight bacteria and viruses

clump together to stop the bleeding

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Blood

Blood that is full of carbon dioxide, enters your heart through the right atrium. As your heart muscles contracts, this blood is pushed into your right ventricle, then your heart contracts again, pushing the blood into your lungs through a large blood vessel.

As this blood travels through your lungs it gets rid of the carbon dioxide and picks up oxygen before flowing back to your heart where it enters through the left atrium.

The next time your heart contracts, this blood is then squeezed into your left ventricle. Then, with the next contraction, this blood is pushed out of your heart and into your body.
**Blood**

The blood that is loaded with oxygen is pushed out of the left ventricle and starts its long journey around your body.

As blood flows passes your small intestine, it picks up tiny bits of digested food. It then delivers these nutrients to all your cells. Blood also transports the carbon dioxide and other waste material away from your cells.

The blood travels through about 96,560 kilometres of blood vessels to reach every cell in your body. These blood vessels make up your circulatory system.

If all your blood vessels were placed end to end, they would be able to circle the world almost two and a half times.
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The path the blood follows
The path the blood follows

1. Blood full of carbon dioxide enters your heart.

2. This blood is then pushed into the right ventricle.

3. It is then pushed into the lungs where it drops off the carbon dioxide and picks up oxygen.

4. Blood full of oxygen enters your heart through the left atrium.

5. This blood is then squeezed into the left ventricle.

6. Then the blood is squeezed into the body.
Blood

When you laugh or giggle, your body releases a chemical that relaxes your blood vessels. This allows more blood to flow through the blood vessels, allowing more oxygen and nutrients to get to your cells.

What are some things that make you laugh? ________________

_______________________________________

_______________________________________

_______________________________________

What is your favourite joke? __________________

_______________________________________

_______________________________________

_______________________________________

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Blood

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_______________________________________
_______________________________________
_______________________________________
_______________________________________

What is your favorite joke?

_______________________________________
_______________________________________
_______________________________________
_______________________________________
Blood contains a protein called hemoglobin. Hemoglobin, contains iron and is what makes the blood red.

Sometimes blood may be bright red and other times it may be dark red. When the hemoglobin joins with blood that is rich in oxygen, the colour of the blood will be bright red.

Blood makes up about 7 percent of your body’s total weight.

If you weighed 45 kilograms, your blood would weigh about 3.15kg.

I weigh _____________________ kilograms.

my blood weighs _______________ kilograms.
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Blood Groups

There are four different blood groups. Do you know which blood group you belong to? ____________________

The blood groups are:

• A
• B
• AB
• O

Blood also contains a chemical called a rhesus factor. Blood that contains this chemical is called rhesus positive (Rh+) and blood that does not, is called rhesus negative (Rh-).

Rh- blood can be given to a Rh+ person but if blood from a Rh+ person is given to a Rh- person, it will make them very sick.

If you have a serious accident and lose lots of blood, you may need to have a blood transfusion. This is when a doctor may use blood from another person, with the matching blood type to replace the blood you lost.
Circulatory System

Circulation means moving things around. The circulatory system gets its name because it circulates blood to every part of your body.

The circulatory system has two main jobs:

1. To carry oxygen and food to all of the cells of the body
2. To carry the waste away from the cells to be removed from the body

The three main parts of the circulatory system are:
• blood vessels
• heart
• blood

There are three types of blood vessels in your body:

1. arteries
2. veins
3. capillaries

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Circulatory System

Circulation means ________________________________

__________________________

__________________________.

Name the three main parts of the circulatory system:

1. ____________________________________________

2. _____________________________________________

3. ______________________________________________

When are the two main jobs of the circulatory system?

1. ______________________________________________

___________________________________________________________________

2. ______________________________________________

___________________________________________________________________
Circulatory System

Arteries carry the blood away from the heart. Artery walls have a thick, outer layer, a middle layer of muscles and fibres and a thin, lining layer. They have to have strong, muscular walls to cope with the pressure of the rushing blood.

Capillaries link the arteries and the veins together. They are the narrowest blood vessels that carry blood through the body tissues. The nutrients and oxygen in the blood carried by the capillaries passes into the body tissues. The walls of the capillaries are so thin that gases and chemicals can pass through them. Waste products are also carried away by the blood in the capillaries.
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Veins carry the blood back to the heart. This blood is not under as much pressure, so the vein walls have few muscles and the middle layer is thinner than the walls of the arteries. Veins also have valves to stop the blood from flowing backwards.

Most of your arteries lie below your veins for a very good reason. When you cut a vein, the blood trickles out slowly, but if you cut an artery, the blood would gush out. This is due to the amount of pressure on your arteries, that comes from your pounding heart.
Circulatory System

What do these blood vessels do?

Arteries

Veins

Capillaries
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