1 Humans and animals

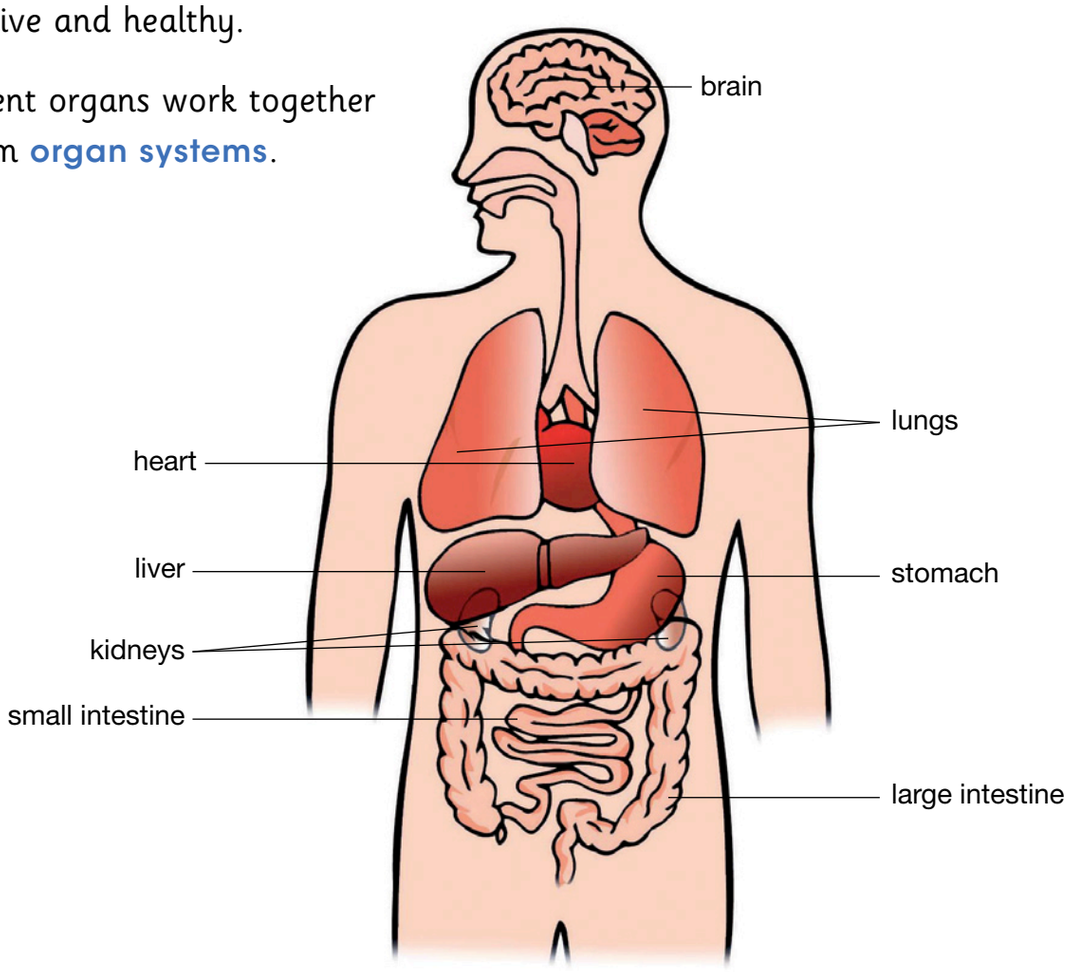
1.1 Body organs

Words to learn
organs organ systems

You know what the outside of your body looks like. But what's inside your body? Think of as many inside parts as you can.

The parts inside your body are called **organs**. The body organs do different jobs to keep you alive and healthy.

Different organs work together to form **organ systems**.



The liver is an example of a body organ. We cannot live without a liver. Two of its main functions are to store energy and to break down harmful substances in the body.

Activity 1.1

Identifying the position of body organs

You will need:
a newspaper • white paper • colouring pens • crayons • glue • scissors

Lie down on the newspaper and ask your partner to draw the outline of your body.
Don't draw around the arms and legs.
Draw outlines of these body organs on the white paper:

- brain
- heart
- stomach
- lungs
- kidneys
- intestines.

Make sure each organ is the right size for the body outline you have drawn.
Label and colour each organ.
Cut out the organs and stick them in the right place on the body.

Questions

1. Which organ is found in the in head?
2. Which organs are found in the chest?
3. Which organs are found in pairs?
4. Which organs are found in the chest?
5. What do you think is the function of each body organ?

Some animals, like the jellyfish, do not have proper body organs. They have more simple parts that carry out their body functions.

What you have learnt

- The parts inside your body are called organs.
- The major body organs are the heart, stomach and intestines, lungs, kidneys and brain.

Talk about it!
How are the body organs protected?

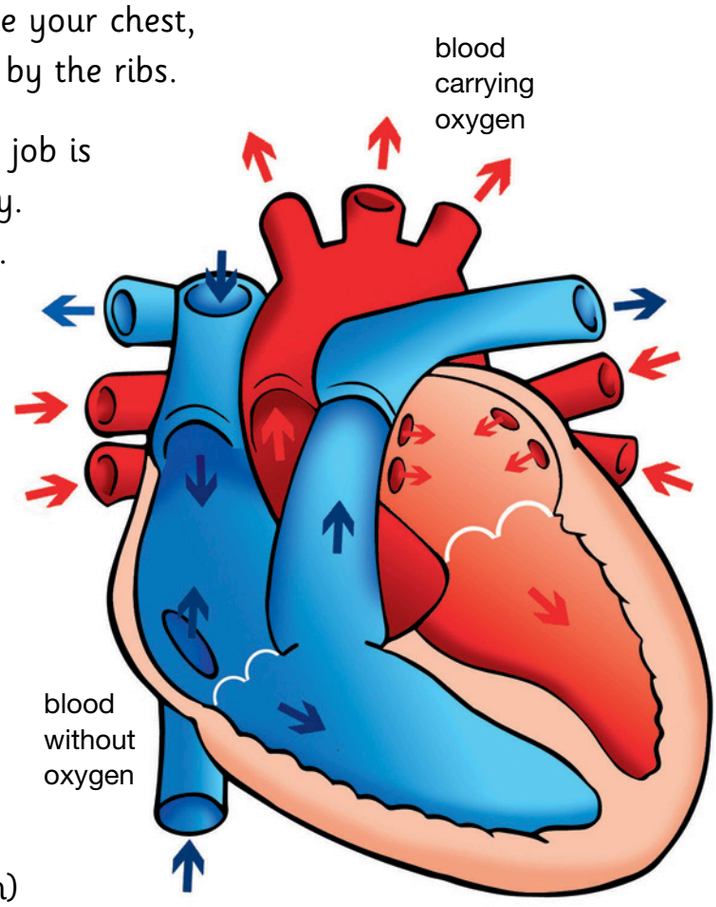
1.2 The heart

Words to learn
heart circulation
blood vessels oxygen
circulatory system

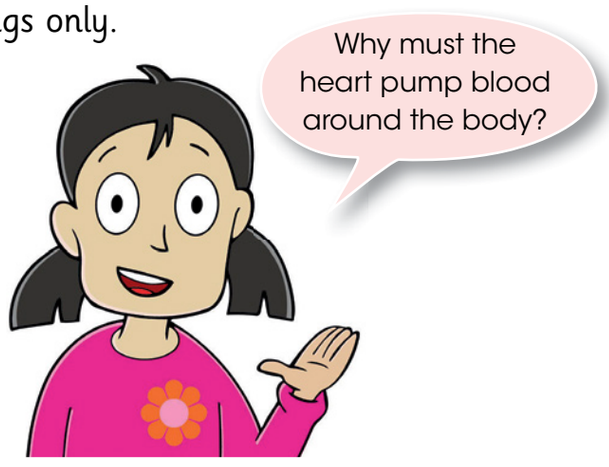
Put your hand on your chest. Can you feel your **heart** beating? Why does your heart beat?

Make a fist with your hand. That's how big your heart is. Your heart is found inside your chest, slightly to the left. It is protected by the ribs.

Your heart is a special muscle. Its job is to pump blood through your body. This process is called **circulation**. Every time the heart muscle squeezes to pump blood, you can feel a heartbeat. It takes less than a minute to pump blood to every part of your body. The heart does this all the time and never stops.



The heart has two sides. The left side (red in the diagram) pumps blood that contains **oxygen** all around the body. The right side (blue in the diagram) pumps blood without oxygen to the lungs only.

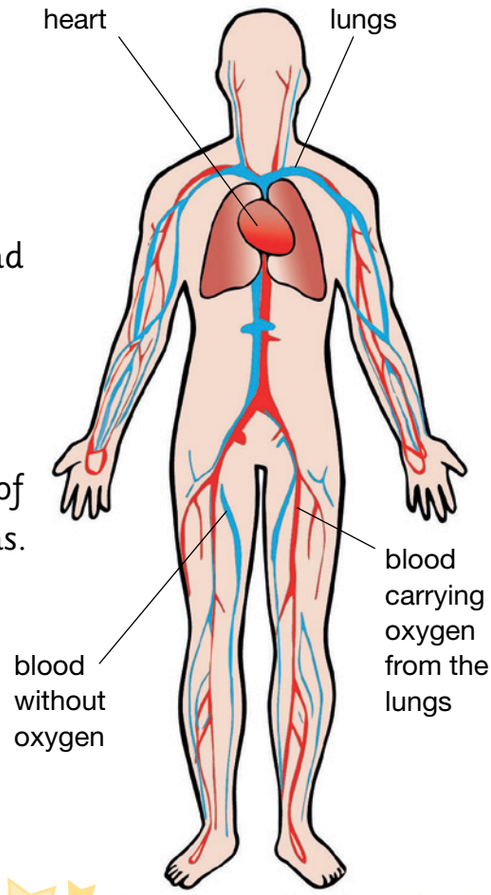


Blood is a red liquid that flows around the body in **blood vessels**. Look at the inside of your wrist. Sometimes you can see the blood vessels through your skin.

Blood vessels run from the heart to the lungs, around the body and back to the heart.

The blood carries food and oxygen to all parts of the body. It also picks up waste products from the body and carries them to organs which can get rid of them. The kidneys and lungs are two of these organs.

The heart, blood vessels and blood form the **circulatory system**.



Questions

1 a What does the heart do?
  b Why does it do this?
2 What is a heartbeat?
3 Why does the heart pump blood to the lungs before it pumps blood to the rest of the body?

Challenge

What is a heart attack and how is it caused?

What you have learnt

- The left side of the heart pumps blood that contains oxygen to the rest of the body.
- The right side pumps blood without oxygen to the lungs.
- The blood carries food and oxygen to all parts of the body and carries away waste products from the different parts of the body.

Talk about it!

How can you tell that your heart is beating without putting a hand on your chest?

1.3 Heartbeat and pulse

Words to learn
pulse pressure

Your heat beats about 90 times a minute. When you are grown up it will beat about 70 times a minute. When you run around, your body needs a lot more food and oxygen. The more active you are, the more often your heart needs to beat to supply enough food and oxygen from the blood.

You can count your heartbeats by feeling your **pulse**. Your pulse is caused by the **pressure** of the blood as the heart pumps it to the rest of the body.

Two good places to find your pulse are on the side of your neck and the inside of your wrist. You will know you've found your pulse when you feel a small beat under your skin. Each beat is caused by the squeezing of your heart muscle.

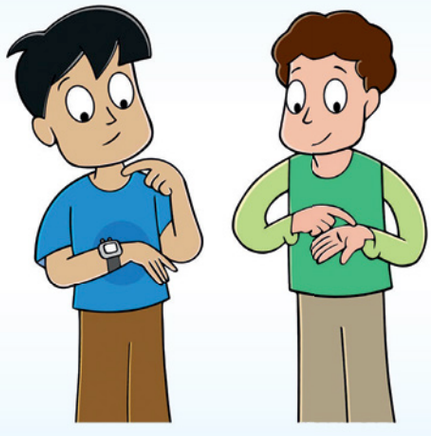
Exercise makes your heart beat faster.

Activity 1.3

Measuring your pulse

You will need:
a watch with a second hand

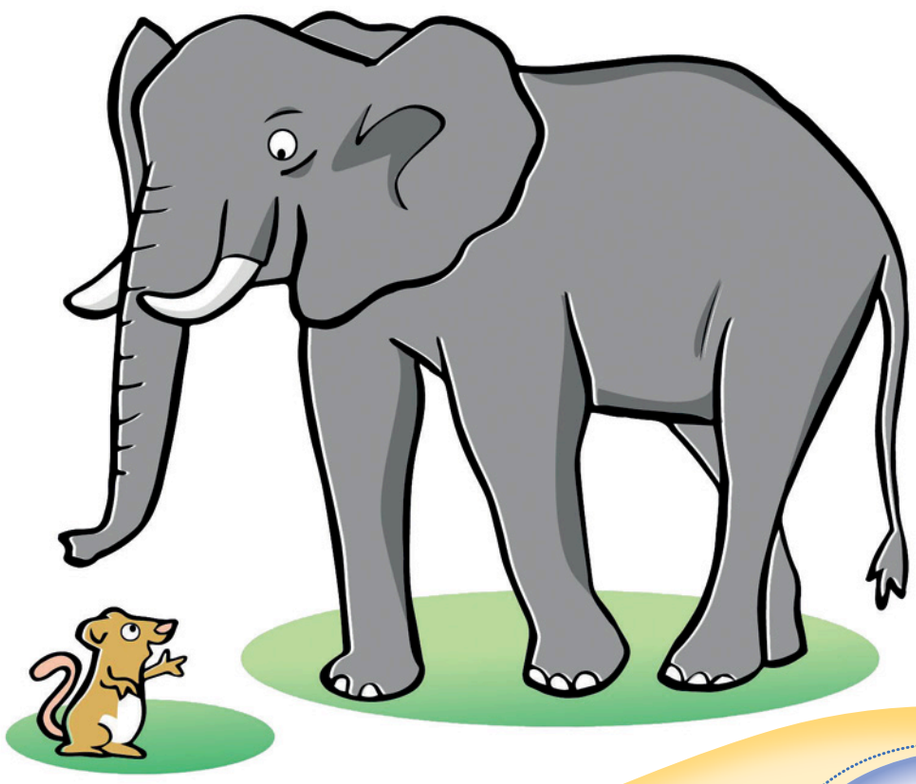
Find your pulse on your wrist or neck. Do not use your thumb to take your pulse – it has a pulse of its own. Count how many beats you feel in one minute. Repeat this three times. Record the results in a table. Is the number of beats the same each time? Compare your measurements with others in your class.
Measure your pulse rate at other times during the day, such as after lunch break and just before you go to bed. What trends can you identify?



Questions

1 What is the difference between heartbeat and pulse?
2 Did everyone in your group have the same pulse rate?
3 a Is your pulse rate always the same?
  b Why do you think this is?
  c How can you work out what your actual pulse rate is?
4 Suggest any factors you think make your pulse rate change.

The elephant has a very low pulse rate of 30 beats per minute.
The mouse has very high pulse rate of 500 beats per minute.



Talk about it!

Why is it dangerous to have a very low pulse rate?

What you have learnt

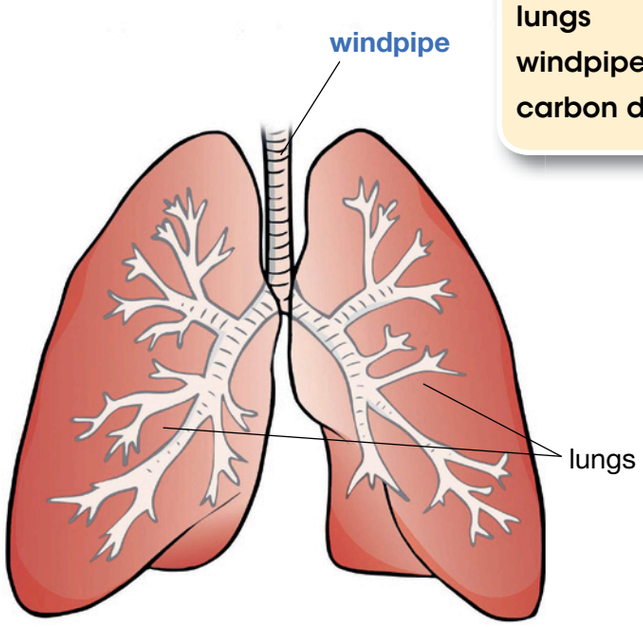
- You can count your heartbeats by feeling your pulse.
- Your pulse feels like a small beat under the skin.
- Your pulse rate increases when you exercise.

1.4 The lungs and breathing

Words to learn
lungs breathing
windpipe
carbon dioxide

We use our **lungs** for **breathing**. We need to breathe to stay alive. We breathe in and breathe out.

The lungs are found in the chest. They are protected by the ribs. The lungs are like stretchy sponges that fill up with air.



Activity 1.4

Investigating breathing

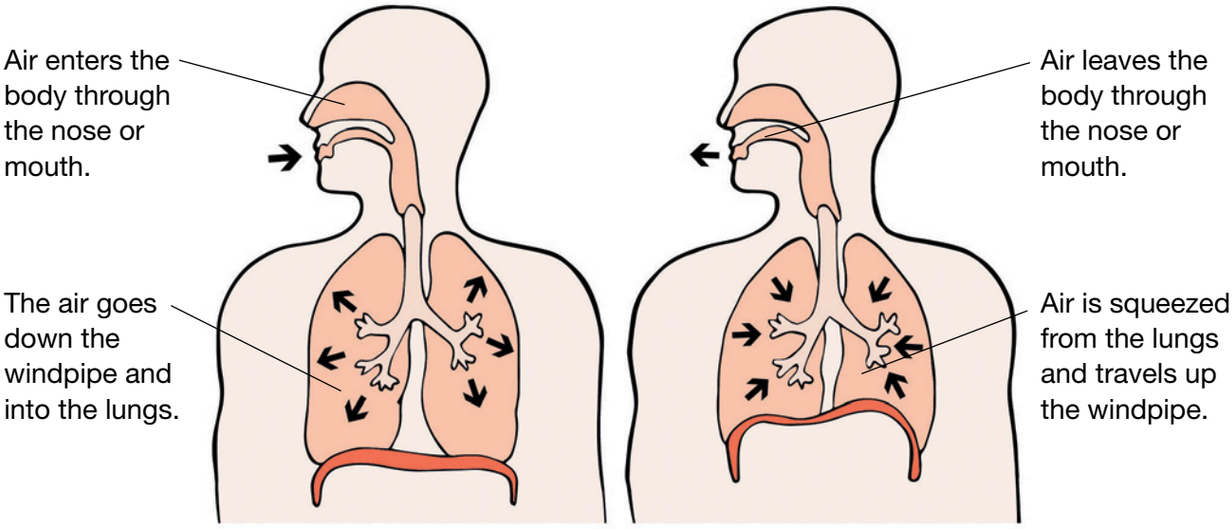
You will need:
a balloon

Put your hands on your ribcage.
Breathe in. What do you feel?
Now breathe out. What do you feel?
Breathe in again. Hold the balloon to your mouth and breathe out. What happens to the balloon?
What does this show you?

Questions

1. When you breathe in, does your chest get bigger or smaller? Why do you think this is so?
2. When you breathe out, does your chest get bigger or smaller? Why do you think this is so?
3. Explain how we are able to blow up a balloon.
4. Why do you think we breathe faster when we exercise?

Breathing



When we breathe in, oxygen from the air moves into the blood vessels in the lungs. Blood carries the oxygen to the heart and then to the other parts of the body. We need oxygen to live.

As your body uses up oxygen, it makes **carbon dioxide**. Carbon dioxide is a waste gas that the body must get rid of. The blood carries the carbon dioxide back to the lungs. We get rid of carbon dioxide in the air we breathe out.

Talk about it!
How do divers breathe underwater?

What you have learnt

- We use our lungs for breathing.
- Our lungs get bigger and fill with air when we breathe in.
- Our lungs get smaller and push out air when we breathe out.
- We breathe in oxygen from the air.
- We breathe out carbon dioxide.

1.5 The digestive system

Words to learn

digestive system
digestion stomach
intestines saliva

Your body needs food to help it grow. Food also gives you energy. But your body cannot use the food you eat just as it is. Food has to be changed so that it can be used by the body.

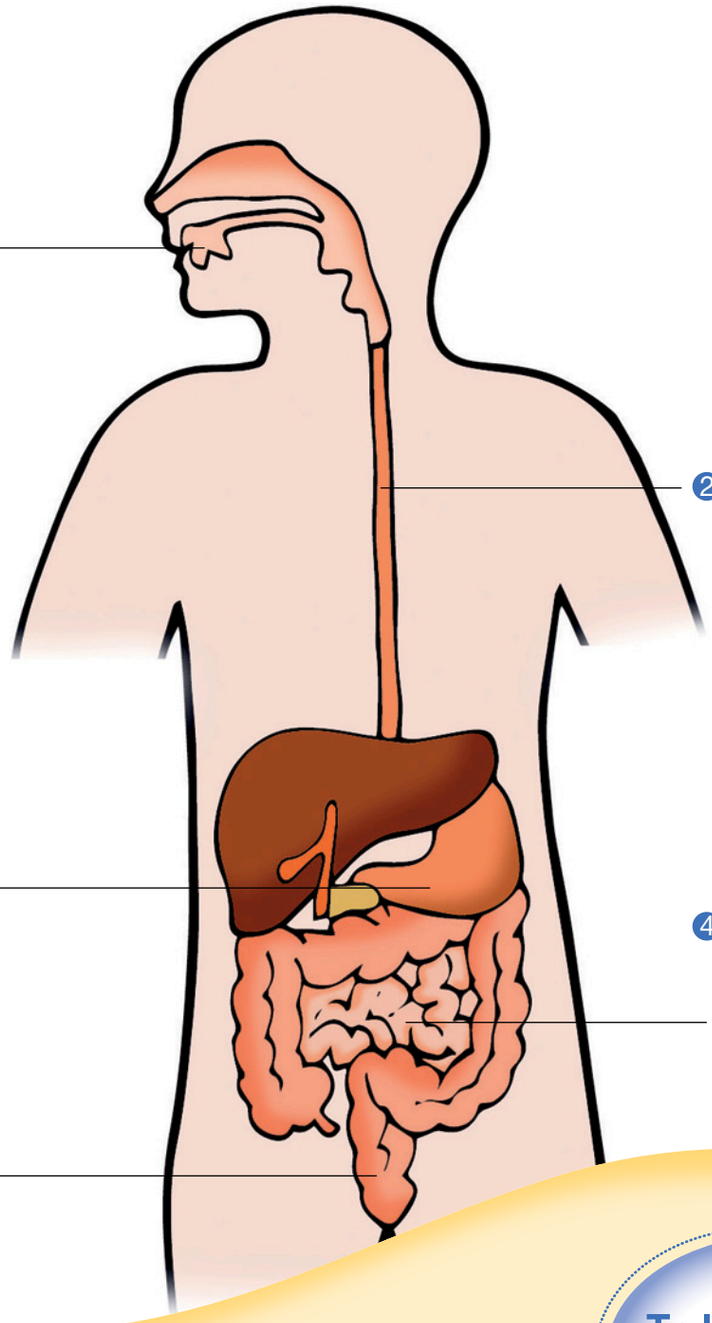
The **digestive system** changes food by breaking it down into tiny particles. This process is called **digestion**.

The **stomach** and the **intestines** digest the food. They are the main organs of the digestive system. Digested food particles pass from the intestine into the blood and are carried to all parts of the body.

The food we eat must be digested so that the body can use it.

Questions

1. Why do we need food?
2. Why must food be digested?
3. How does the stomach help digestion?
4. What happens to food in the intestines?
5. How does the digested food reach all parts of the body?



1 Your teeth chew and chop up the food into smaller pieces that we can swallow. Digestive juices in **saliva** start digesting food.

2 The food we swallow is pushed down a tube called the gullet and into the stomach.

3 Inside the stomach the food mixes with digestive juices that turn the food into a thick liquid similar to porridge.

4 The intestines break down the food even more until the food particles are small enough to move into the blood.

5 Any undigested bits of food that your body can't use are pushed out of the end of the intestines when you go to the toilet.

Talk about it!

Why is baby food soft and mushy?

What you have learnt

- The body needs food to help it to grow and have energy to work properly.
- Food is broken down into small particles by the process of digestion.
- The stomach and the intestines digest food.
- Digested food is carried in the blood to all parts of the body.