

**2** Keeping healthy

**1** A healthy diet

**Ideas you need from KS3**





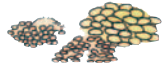



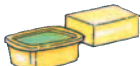
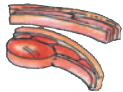




We often see or hear in the media, ‘You are what you eat’. There is some truth in this. But we are also a product of our genes, our environment and our lifestyles.

A healthy diet contains everything your body needs. It shouldn’t contain things that harm you.

All the food you eat is your diet. So everyone is on a diet, not just people trying to lose weight.

Some nutrient groups in your food	What your body needs it for
carbohydrates	energy
proteins	growth and replacing cells (you use excess for energy)
fats	energy and making cell membranes
vitamins	healthy cells

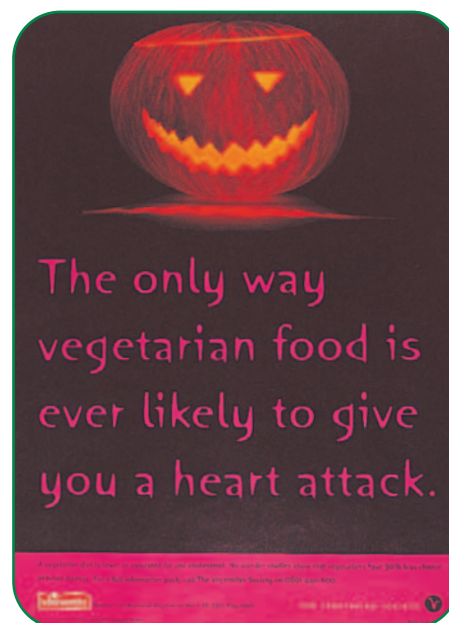
- Write down four nutrient groups that a healthy diet should contain.
- Plan a simple snack lunch that contains all these things. It should also contain other vitamins, fibre, water and minerals such as iron and calcium.

<p><b>Carbohydrate foods</b></p>  bread  cereals  fruit  root vegetables and potatoes	<p><b>Protein foods</b></p>  pulses (peas, beans and lentils)  fish, meat and cheese  eggs
<p><b>Fat foods</b></p>  cheese  margarine  red meat	<p><b>B vitamin foods</b></p>  meat  bread  cereals  yeast extract

**Different diets for different people**

There are lots of ways of getting a healthy diet. Different people choose different types of food. Many people eat less red meat now than they did. Vegetarians don’t eat any meat at all.

- Why do you think people become vegetarians?
- A diet without meat may be healthier. Explain why.
- What can vegetarians eat to get enough
  - protein?
  - B vitamins?



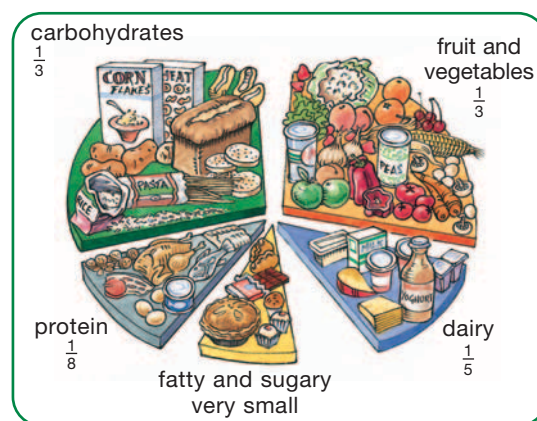
Eating too much animal fat may cause heart disease.

### What is the right balance?

The diagram shows what the Food Standards Agency recommends.

6 Draw and complete a table with these headings.

Food group	Suggested proportion



The proportions of different food groups in a healthy diet.

### What if you don't get enough of a nutrient?

Shortage of energy foods can make you too thin.  
 Shortage of proteins affects your growth.  
 The amounts of vitamins you need are small. But if you don't get enough your body won't work as it should.  
 We call a problem caused by lack of a particular nutrient a **deficiency disease**. The table shows a few of these diseases.

- 7 Write down the deficiency disease caused by lack of vitamin C.
- 8 What is anaemia?

Nutrient	Deficiency causes ...
vitamin A	poor night vision (night blindness), dry skin
vitamin B <sub>3</sub>	wasting, skin and mental problems (pellagra)
vitamin C	weakness, bleeding (scurvy)
vitamin D	soft bones (rickets)
iron	tiredness owing to lack of haemoglobin (anaemia)

### What if you get too much?

Eating more **energy** foods than you need makes you put on weight. You store the excess as fat. Too much of nutrients such as vitamin A or vitamin D can actually poison you.

9 Why is there a warning on many vitamin pills packs not to exceed the stated dose?

It's the balance of your diet over days that matters, not what you eat in just one meal. Continually having too much or too little of a nutrient makes your diet unbalanced. You become **malnourished**.

What you need to remember *Copy and complete using the key words*

**A healthy diet**  
 A healthy diet contains the right balance of the different \_\_\_\_\_ and the right amount of \_\_\_\_\_.  
 We say that a person whose diet is not balanced is \_\_\_\_\_.  
 A malnourished person may be too fat, too thin or have a \_\_\_\_\_.

## 2 Keeping healthy

### 2 Energy balance

#### A balanced diet!

Even if your diet is varied and contains all the vitamins and minerals you need, your diet could still be unbalanced in terms of energy.

- 1 Write down
  - a the two main groups of energy foods
  - b two things that affect the amounts you need.
- 2 What happens to your body mass if you
  - a use more energy than the amount of energy in your food?
  - b use less energy than the amount of energy in your food?

#### Energy needs vary

The amount of energy you need varies with:

- the temperature – you need less **energy** food in warm weather
- the amount of exercise you do – the more exercise you do, the more energy food you need.

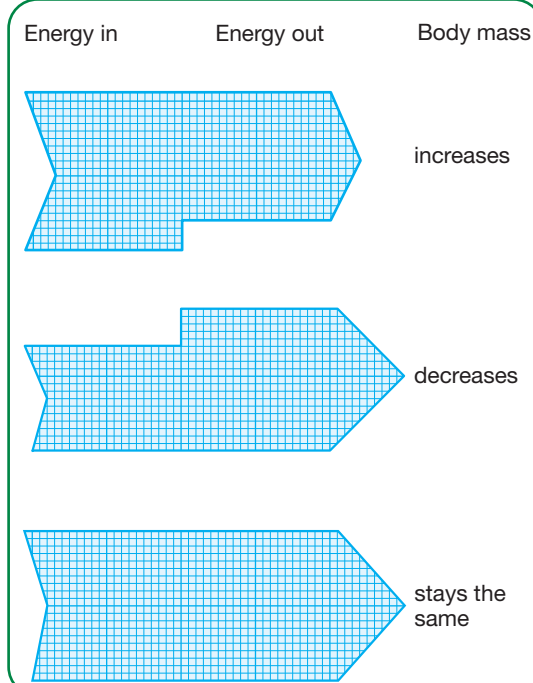
If you are one of those people who can eat lots without increasing your body mass, it may be that the rate of chemical reactions in your cells is high. We say that you have a high **metabolic rate**.

- 3 Write down three things that affect the amount of energy food you need.
- 4 Copy and complete the sentences.  
 People with a high \_\_\_\_\_ rate tend not to gain body \_\_\_\_\_ easily.  
 This is because the rate of \_\_\_\_\_  
 \_\_\_\_\_ in their cells is high.  
 Their cells quickly break down \_\_\_\_\_ and sugars.
- 5 Write down three things that affect your metabolic rate.

#### REMEMBER

You use energy released in respiration from carbohydrates, fats and excess proteins in your diet for:

- moving
- growing
- keeping warm.



If you take in more energy in food than you use, you store the extra as fat. To keep your body mass the same, your energy intake and use should balance.

Some things that affect your metabolic rate are:

- **inherited** factors (your genes)
- the amount of exercise you do (regular exercise can increase your metabolic rate)
- the proportion of **muscle** to fat in your body
- your hormones.

## More benefits of exercise

You have seen that **exercise** increases your metabolic rate. Even when you've finished exercising, your metabolic rate stays high for a while. The longer you exercise for, the longer it stays high.

Exercise also increases the size of your muscles. The more muscle cells you have and the more active they are, the more glucose they respire.

People who exercise regularly are usually **fitter** than people who don't. They can exercise for longer without getting tired and out of breath.

**6** What are the benefits of having a body with

- a more muscle?
- b less fat?

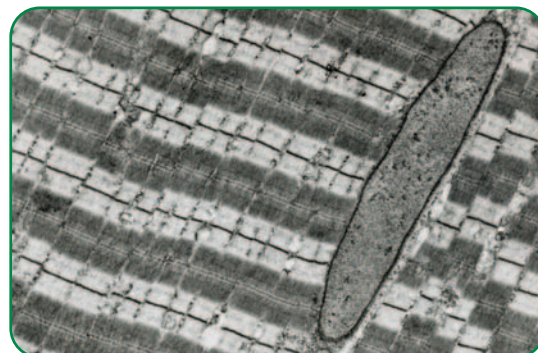
**7** Look at the photographs of the cells.

- a Which two cell types respire fastest?
- b Which cell type has a low metabolic rate?

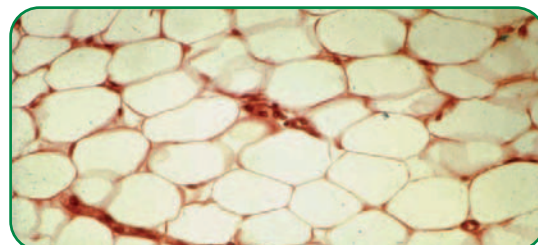
Some people are overweight because the rate of chemical reactions such as respiration in their cells is low. They respire energy foods slowly and store the excess in fat cells.

**8** Suggest two things that these people can do to lose body mass.

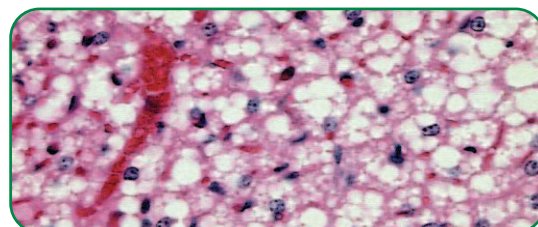
Give reasons for your suggestions.



Muscle cells use the energy released in respiration to contract. They have a high metabolic rate.



White fat cells are energy stores. They form useful insulation and padding – a bit like cushions around delicate organs. They have a low metabolic rate.



Brown fat cells have a high metabolic rate. They store fat in many small globules and can break it down quickly to release lots of heat (thermal) energy.

What you need to remember *Copy and complete using the key words*

### Energy balance

The rate at which chemical reactions happen in your cells is called your

\_\_\_\_\_.

It depends on

- how active you are
- the proportion of \_\_\_\_\_ to fat in your body
- your genes (\_\_\_\_\_ factors).

\_\_\_\_\_ increases your metabolic rate and it stays high for some time after you finish exercising.

If you take regular exercise, you are likely to be \_\_\_\_\_ than people who don't.

The less exercise you take and the warmer it is, the less \_\_\_\_\_ food you need.

**2** Keeping healthy

### 3 More about body mass

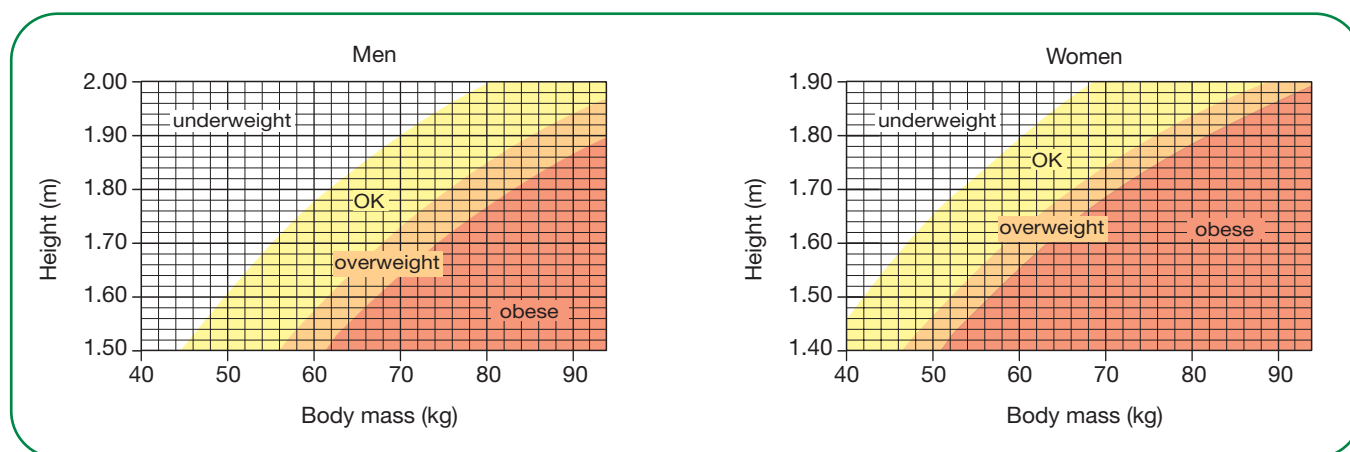
#### What is normal body mass?

As with other features of the human body, there is a range of normal body mass. It depends on your sex, height, age and skeleton.

- 1** Use the chart to find out the range of normal body mass for a female who is 1.60m tall.
- 2** At what body mass do we say that a male 1.70 m tall is underweight?

Doctors and fitness experts use several ways of assessing body mass. They use

- height-weight charts
- body mass index (BMI)
- skin fold measurements.



These charts are for adults. During puberty, body mass increases before the growth spurt. So, at that time, a higher body mass than shown on the chart may be normal.

#### What if your body mass is too low?

In the developed world, people who are underweight are either ill or have deliberately dieted to lose weight.

In the developing world, some people have no choice. They rarely get enough to eat. This may be because

- their crops have failed
- they are too poor or have no land
- there just isn't any food to buy.

Their **health** suffers. Children and old people are often the worst affected.

- 3** Copy and complete the sentences.

People who don't get enough \_\_\_\_\_ are often ill because their \_\_\_\_\_ to infection is \_\_\_\_\_. Women's periods become \_\_\_\_\_.



Lack of food means that this family have poor resistance to **infection**. The mother's **periods** are irregular.

What if your body mass is too high?

In places such as the UK in the developed world, many people eat too much and take too little **exercise**. So many people are **obese**.

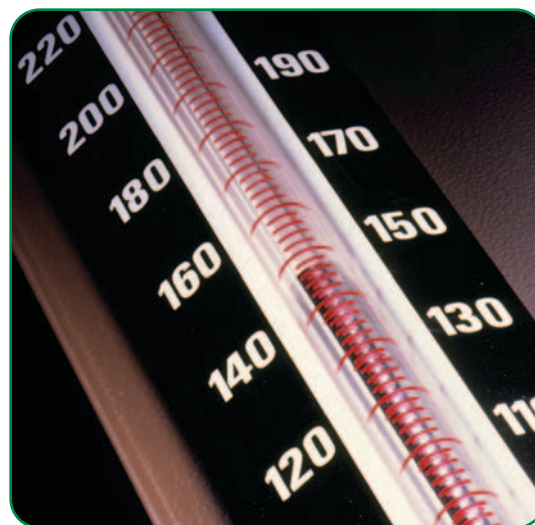
If you are fat (**overweight**) or very fat (obese), you are more likely to have health problems.

4 Look at the photographs. Then copy and complete the table.

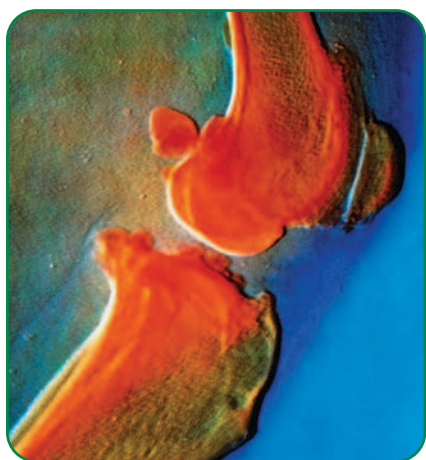
Result of being overweight	Effect on health
too much weight on limbs	
fat deposits in arteries	
narrowing of arteries	
cells take up sugars slowly	

**REMEMBER**

To keep your body mass the same, your energy intake and use must balance.



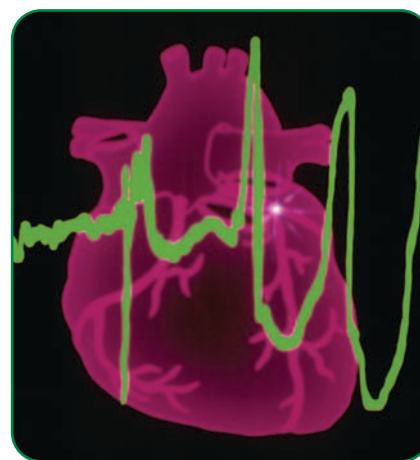
Narrow arteries cause **high blood pressure** (blood pressure of more than 140/90 mm Hg).



**Arthritis** (worn joints).



**Diabetes** (too much sugar in the blood).



**Heart disease**.

What you need to remember *Copy and complete using the key words*

**More about body mass**

In the developed world many people eat too much and take too little \_\_\_\_\_.

They easily become \_\_\_\_\_ and develop health problems.

People who are \_\_\_\_\_ are at greater risk of getting diseases linked with excess weight such as \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

In the developing world, some people have \_\_\_\_\_ problems linked to lack of food. They may have poor resistance to \_\_\_\_\_. Women may have irregular \_\_\_\_\_.

## 2 Keeping healthy

### 4 How can you lose body mass?

In the developed world, more people are worried about being overweight than being underweight. So at any one time thousands of people are on slimming diets.

The United Nations suggests that adults need a diet containing 8800 kilojoules of energy a day. In the USA and Europe, there are people who live on less than half of that and still don't lose body mass. This is because constant dieting and lack of exercise have lowered their metabolic rates. 5000 kJ a day is a starvation diet in the developing world. It's not enough for people who are active and have a normal metabolic rate.

- 1 Suggest why, when they eat the same amount, some people gain and others lose weight.

In theory, you can lose body mass if you

- eat only 5000 kilojoules a day (you are taking in less energy than you use)
- take more exercise (your cells release more energy in respiration).

- 2 Write down two reasons why exercising can help you to lose weight.

- 3 How can people who have failed to slim on 5000 kilojoules a day lose body mass?

#### Slimming programmes

Many people in the developed world are overweight or obese. So slimming programmes are big business.

Look at the advertisement.



- 4 Suggest disadvantages of eating a diet of mainly one thing.
- 5 Why shouldn't you follow a very low energy slimming programme like this one for more than a few weeks?



These two people have very similar diets. The one on the right does very little exercise and has a low metabolic rate.



Exercise increases your metabolic rate and helps you to build muscle.

#### A 'souper' diet



On our diet you can lose up to 6 kg in a week. You can eat as much of our special vegetable soup as you like. Each day you also have a different 'extra' food so you don't get bored.

Why not give us a call on ...

## Sensible slimming

There are lots of different slimming programmes. Many involve 'calorie counting' in order to eat a very low-energy diet.

- 6 Which nutrients may be in short supply in a low-energy (calorie counting) slimming diet?
- 7 What can a slimmer do to get enough of these nutrients?

### The Atkins way – no need to feel hungry

On the Atkins diet, you can eat as much meat and fatty foods as you like. Cut out the carbohydrates and you'll lose weight!

- 8 Look at the newspaper cuttings.
  - a Write down two benefits of joining a slimming club and suggest two problems.
  - b A high-fat diet may be bad for your heart. Which diet is high in fat?
- 9 What can you do to make sure that you don't put the weight back on when you stop dieting?

### REMEMBER

Carbohydrates, fats, proteins, vitamins, minerals, fibre and water are all important for your health.

### Slimming club diets

Joining the club benefits you in lots of ways. You learn how to change your eating habits and put together a low calorie diet that you'll enjoy. The exercise classes are safe and you have other people to turn to help when you need them.

### Food replacement diets

Some people slim by replacing two meals a day with drinks containing proteins, vitamins and minerals. This ensures that they get all the essential nutrients. But when they go back to their old eating habits, they put the weight back on.

## When slimming goes too far

With a good slimming programme, you usually eat less but have the normal number of meals. You don't usually become too slim. A few people do. Their body mass drops low enough for it to put their health and their lives at risk.

They use up all the stores of carbohydrates and fats in their bodies. Then they start to break down the proteins in their muscles, including their hearts. They have anorexia.

- 10 If you use up all your carbohydrate and fat stores
  - a what is your energy source?
  - b how does this harm your health?

### What you need to remember

#### How can you lose body mass?

There is nothing new for you to remember in this section.

You need to be able to evaluate claims made by slimming programmes.



## 2 Keeping healthy

### 5 Diet and heart disease

#### Risk factors

Diet is just one of the risk factors for **heart disease**. It's not the only one that you can control.

- 1 Write down three things that affect the health of your heart that
  - a you can't change
  - b you can change.

Processed foods, including fast foods such as burgers, often contain a lot of **salt** and **fat**. Having too much fat can raise your **blood pressure** and increase your risk of heart disease. Salt does the same in about 30% of people.

However

- salt and fat both make food more tasty
  - we need fats in our diet. We can't make cells without them.
- 2 Why do people choose fatty and salty foods rather than healthier foods?
  - 3 Look at the food label. Write down two good things and two bad things about the nutrients in this food.
  - 4 Which groups of fats may be healthier for your heart, and why?

#### FACT FILE

What affects the health of your heart?

- Inherited factors – the amount of cholesterol your **liver** makes depends on your genes as well as on your diet.
- Your age – the older you are, the greater the risk.
- Your sex – until the menopause, women are at lower risk.
- Your lifestyle – including diet, exercise, smoking, alcohol and stress.

#### Cauliflower Cheese

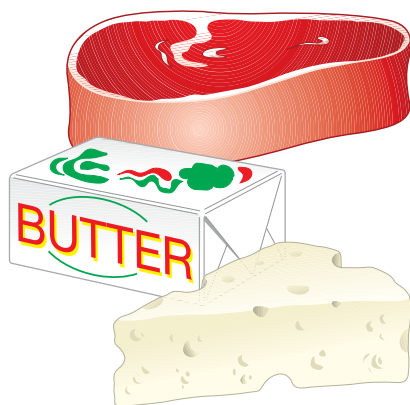
##### NUTRITION

Typical Values	per pack	per 100 g	
Energy Value (Calories)	1560kJ 375 kcal	390kJ 95 kcal)	
Protein	22g	6g	HIGH
Carbohydrate (of which Sugars)	14g 3g	3g 0.8g)	LOW
Fat (of which Saturates)	26g 16g	6g 4g)	HIGH HIGH
Fibre	4g	1g	MEDIUM
Sodium	1.0g	0.2g	HIGH
Salt	2.4g	0.6g	HIGH

This label is from a single serving of cauliflower cheese.

A healthy diet includes plenty of unprocessed foods and lots of fresh fruit and vegetables. It should be low in red meat, fat, salt and sugars. Fish, including oily fish, are beneficial.

Animal fats are rich in **saturated** fat and may increase the amount of blood cholesterol.



monounsaturated fats



polyunsaturated fats



These may help to lower blood cholesterol.

## Cholesterol isn't all 'bad'

The **cholesterol** in your blood doesn't all come from your food. You also make it in your liver. It's a normal body fat and it travels in the blood as **lipoproteins**, a combination of protein and fat. There are two kinds. 'Bad' or **LDL** cholesterol can form deposits in arteries and cause heart disease.

Look at the picture.

- 5 When cholesterol deposits form, what happens to the space inside an artery?
- 6 What effect does this have on blood pressure?
- 7 What happens to heart muscle when it doesn't get a good supply of oxygen?

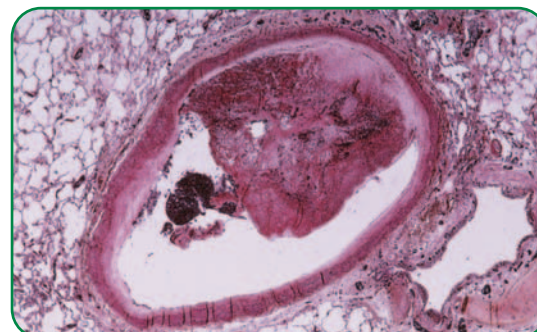
We sometimes call **HDL** cholesterol 'good' because it protects your arteries against becoming blocked. People at risk of heart disease may be sent for a cholesterol test. This measures the LDL, HDL and total cholesterol in their blood.

The LDL/HDL balance is important. Ideally, LDL cholesterol should be below 3 mmol per dm<sup>3</sup> and total cholesterol at or below 5 mmol per dm<sup>3</sup>.

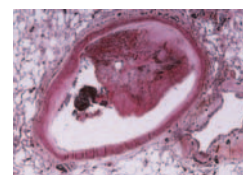
- 8 Why would a doctor think that a blood LDL cholesterol reading higher than 3 mmol per dm<sup>3</sup> was a problem?

Doctors suggest that people with too much cholesterol in their blood should

- eat a diet low in saturated fat to lower the amount of LDL cholesterol
- take plenty of exercise to raise the amount of HDL cholesterol



The narrowing of the space inside this artery causes blood pressure to rise.



It would take only a small blood clot to block this artery.  
 If an artery to part of the heart muscle (a coronary artery) is blocked, the blood supply to that part stops.

That part of the muscle doesn't get the oxygen it needs so it stops working. Then it dies. This is a heart attack.

What you need to remember *Copy and complete using the key words*

### Diet and heart disease

Processed foods often contain a high proportion of \_\_\_\_\_ and \_\_\_\_\_.  
 For about 30% of the population, too much salt can cause an increase in \_\_\_\_\_.

The fat in your diet and inherited factors affect the amount of \_\_\_\_\_ your \_\_\_\_\_ makes. Two types of \_\_\_\_\_, LDL and HDL, carry cholesterol around your body. High levels of LDL (bad) cholesterol increase your risk of blood vessel damage and \_\_\_\_\_. HDL (good) cholesterol protects your arteries.

Eating polyunsaturated and \_\_\_\_\_ fats may lower blood cholesterol and help to improve the LDL / HDL balance that is important for heart health. Eating \_\_\_\_\_ fats can increase blood cholesterol.