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# Living things: Human body

Most young children imagine that their body is a kind of skin bag that holds food, blood and waste. Stomachs are commonly imagined to be large, low-slung containers, often with two exits, corresponding to the double functions of lavatories. But children will also have connected the stomach with the breaking down of food and they may sense that it is transferred somewhere else in the body. The word 'diet', however, is almost always associated with weight loss, and not with the balanced intake of foods that should characterise healthy eating.

We need a range of foods for healthy living. These can be provided from a variety of sources, and commonly include carbohydrates for energy, fats for both energy and general body functions, proteins for growth and repair, and small amounts of vitamins and minerals for general health and resistance to disease. We can obtain these foods from many different sources, including plants and animals; a balanced diet provides them in the right quantities.

A balanced diet and regular exercise are essential for health. There are few intrinsically good or bad foods or means of exercise; we all need to develop a lifestyle that suits our individual needs. There are many definitions and measures of fitness. Some individuals are on special diets for cultural or religious reasons, have medical problems, or difficulties like obesity.

Most people are aware of the major food groups, and the importance and characteristics of each. Packaged foods are clearly labelled and ingredients identified. Food habits are formed before school, and for primary children these are likely to reflect family values and parental choice, as well as children's own decisions.





# Lesson 1: Food and nutrition

## Lesson preparation

### Objectives

- ① explain what is meant by nutrient, and describe how plants and animals obtain the nutrients they need
- ② list the five main nutrients the human body needs and explain their role in the diet
- ③ explain the importance of fibre (roughage) in the diet

### Science skills

classifying

### Equipment

**Warm up:** a meal

**Extension:** research facilities

### Key words

**carbohydrates:** starch, glucose, sucrose and foods containing these nutrients; the substances in sugary and starchy foods that give us energy

**fats:** the main nutrients in fatty foods such as butter and lard; eating fats gives us energy, but eating too much fatty food makes us fat

**fibre:** tough indigestible parts of food; fibre aids digestion by bulking up the faeces so they pass easily through the body

**minerals:** pure non-living substances; a substance that living things need in small amounts to grow well

**nutrients:** substances the body needs to grow, maintain and repair itself

**proteins:** the nutrients needed for growth and repair; the substances in foods such as fish, nuts and beans that help to build and repair our bodies

**vitamins:** essential substances that we require in small quantities for health; fresh fruit and vegetables contain vitamins

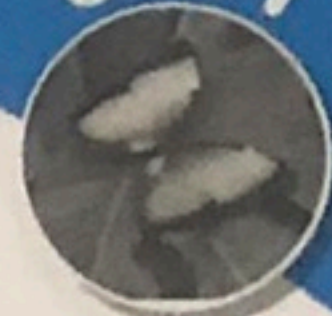
### Background information

Advice on healthy eating seems to vary week by week. But some facts are unchanging: we need to eat to fuel, maintain, repair and (when young) grow our bodies; we need a balanced diet for health; too much food, especially carbohydrates and fats, can be stored in the body and will lead to increased weight and possibly obesity.

Most foods contain more than one nutrient, and many contain quite a range, so it is difficult to condemn any food as being unhealthy. No food is of itself harmful; it is the excess that can damage your health. Some nutrients, for example minerals and vitamins, are only needed in extremely small quantities, and any excess is excreted.

Note that students commonly relate the word diet to a weight-reducing regime; in science, a diet describes the range of foods eaten by an animal or human.





## Lesson plan

### Warm up

Bring in a meal for the students to name and analyse. You might choose a healthy meal or one that is deliberately unhealthy or possibly one of each.

Ask the students to tell you the foods you have in the meal. *Which are energy foods? Which are foods that will help to maintain and repair my body? Which contain important nutrients to keep me healthy? Does it contain energy foods? Does it contain proteins? Does it contain the small amount of fat which I need? Do you think it contains vitamins and minerals? Foods should contain fibre or roughage which helps to push the food through the gut. Do you think this meal contains roughage?*

Ask the students to work in groups to plan a meal that contains all the food groups.

### Activity 1 p11

Ask the students to record a food diary for one day. Ask them to record all that they ate and drank from breakfast one morning to breakfast the next. They should group them into food from plants and food from animals.

They could also look for examples of food to provide carbohydrates, proteins, fats, vitamins, minerals and fibre. *Are there examples of all of these?*

Ask the students to work in groups and examine each other's food diaries. They can make suggestions to ensure that all the food groups are represented in at least some of the meals eaten during the day.

### Activity 2 p13

#### Answers

- 1 carbohydrates: provide energy
- 2 proteins: help the body to grow and repair
- 3 fats: build and maintain body parts and provide energy
- 4 vitamins: special substances that cannot be made by the body
- 5 minerals: build bones, carry oxygen in the blood and control blood pressure
- 6 fibre: bulks up waste

### Extension

Ask the students to explore the diets of different animals and find out the proportions of different nutrients that animals eat. They may find some surprises; for example many carnivores are able to make their own vitamin C. This compensates for the fact that they do not eat fresh fruit and vegetables.

Babies and older people may have different nutritional requirements; work together to plan a healthy diet for different age groups.

### Concluding the lesson p13

#### What you have learnt answers

Our food gives us the different nutrients our bodies need to stay healthy and grow. We need carbohydrates for energy, and proteins for growth and repair. We need some fats for making and maintaining body parts, but not too many. To stay healthy we also need vitamins and minerals in small quantities. These substances perform special tasks in the body. Fibre does not give us nutrition, but it helps waste pass easily through the body.



**Check your progress answers**

- 1 A nutrient is any substance that provides essential nourishment to maintain life. Accept any five.
- 2 Fibre bulks up food, making it easier for food to pass through and out of the gut.
- 3 carbohydrates for energy; proteins for growth and maintenance; vitamins.

**After the lesson****Workbook p4–5****Answers**

- 1 plants: rice, fruit, oil, tomatoes, bread  
animals: eggs, butter, meat, cheese
- 2 minerals; carbohydrates; fats; proteins; vitamins
- 3 **a** carbohydrates **b** proteins **c** fats **d** vitamins **e** minerals
- 4 **a** to carry oxygen in the blood **b** to build bones **c** to control blood pressure. (Students do their own research on minerals.)
- 5 **a** plants **b** animals **c** digestion **d** fibre

## Lesson 2: Food groups

### Lesson preparation

**Objectives**

- ① identify the main food groups provided by common foods
- ② name foods that provide vitamins and minerals in the diet
- ③ know how to test for two food types

**Science skills**

classifying

**Equipment**

**Warm up:** a selection of different foods

**Extension:** research facilities

**Key words**

**butter:** solid fat separated from milk

**food tests:** chemical and physical tests that identify the food groups different foods contain

**meat:** the flesh of animals

**nutrients:** substances the body needs to grow, maintain and repair itself

**starchy:** describes foods that are mainly starch

**sweet:** one of the four basic tastes; sugar is sweet





## Background information

Staple foods – bread, cereals, rice and roots – contain starch, which is a carbohydrate, the stored form of sugar. Some sweet foods, including sugar and honey, contain carbohydrates too. Meat is not the only source of protein: fish, beans and pulses, eggs, dairy products, seeds and nuts all contain a proportion of protein. We all need a small amount of fat: butter, margarine, groundnuts, animal and plant oils and fatty meats contain high proportions of fat. They can often be recognised because oils and fats produce a translucent spot on paper.

Many foods contain essential vitamins, and a varied diet should provide all that we need.

## Lesson plan

### Warm up

It is important to emphasise that most foods contain more than one food group. It is very easy to believe that, for example, meat is solely a protein food, whereas it contains other food groups and a number of essential vitamins. Introduce some simple foods, for example, an egg, a green vegetable, rice, fruit. Ask the students what food groups they contain.

*Why should I eat this egg? Will it give me energy? Will it help me to maintain and repair my body? Does it contain any vitamins and minerals?*

*This green vegetable looks healthy. What food groups does it contain? Does it contain any vitamins and minerals?*

*Rice is an energy food. Does it contain any other food groups? Do you think it contains any vitamins?*

*I know I should eat lots of fruit to stay healthy. So fruit contains some important vitamins. But does it contain any other food groups? Which ones?*

### Activity 1 p14

Students complete their own nutrients diagram, putting the food pictured in the correct circle. Point out that some of the foods will go in the areas where the circles overlap.

### Activity 2 p15

Explore the table with the class, and ask them to ensure that they are regularly eating at least one food that contains each of the essential vitamins.

### Extension

Ask students to explore animal diet; the book describes the diet of the giant panda, which can only eat bamboo shoots, and the koala bear, which only eats eucalyptus leaves. Ask them to find other examples; and to explain why the dependence on a single food source like this puts the animal at risk of extinction. Ask groups of students to research one vitamin; and to present their findings to the rest of the class. *What is unique about Vitamin D? It is one vitamin that we can manufacture for ourselves by the effect of sunlight on our skin.*

## Concluding the lesson p16

### What you have learnt answers

Food contain different nutrients. Sweet and starchy foods are rich in carbohydrates. Dairy foods, nuts, beans, fish and meat are good sources of protein. Oil, margarine and butter are fatty foods. We can use food tests to identify the different nutrients that a food contains.