

# Eating well for good health



Lessons on nutrition and healthy diets





# Eating well for good health

Lessons on  
nutrition  
and  
healthy diets

*by*

**Valeria Menza**

Nutrition Officer

Nutrition Education and

Consumer Awareness

FAO Nutrition Division


*and*

**Claudia Probart**

Associate Professor of

Nutritional Sciences

Penn State University



Food and Agriculture Organization of the United Nations,  
*Rome, 2013*

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISBN 978-92-5-107610-1 (print)

E-ISBN 978-92-5-107611-8 (PDF)

© FAO 2013

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via [www.fao.org/contact-us/licencerequest](http://www.fao.org/contact-us/licencerequest) or addressed to [copyright@fao.org](mailto:copyright@fao.org).

FAO information products are available on the FAO website ([www.fao.org/publications](http://www.fao.org/publications)) and can be purchased through [publications-sales@fao.org](mailto:publications-sales@fao.org).

**For further information, please contact:**

Nutrition Division,  
Food and Agriculture Organization  
of the United Nations,  
Viale delle Terme di Caracalla,  
00153 Rome, Italy  
E-mail: [nutrition@fao.org](mailto:nutrition@fao.org)  
Web site: [www.fao.org](http://www.fao.org)

## Contents

List of materials	v
Foreword	ix
Acknowledgements	xi
Introduction	xiii
Module structure and content overview	xiv
How to use the lessons	xv

### **Topic 1** What it means to be healthy and well-nourished 3

<b>Lesson 1</b>	Exploring the meaning of good health and well-being	5
Part 1	The dimensions of health	6
<b>Lesson 2</b>	Analysing the conditions that affect nutritional status	19
Part 1	Fundamental conditions for good nutritional status	20
Part 2	Malnutrition: poor nutritional status	25
<b>Lesson 3</b>	Understanding problems of poor nutrition	37
Part 1	Problems of undernutrition	38
Part 2	Problems from a lack of vitamins and minerals	42
Part 3	Problems of “overnutrition”	49

### **Topic 2** What we get from food 71

<b>Lesson 4</b>	Learning about carbohydrates, protein and fats	73
Part 1	Carbohydrates: their functions and good food sources	74
Part 2	Protein: its functions and good food sources	79
Part 3	Fats: their functions and good food sources	82
<b>Lesson 5</b>	Learning about vitamins and minerals	107
Part 1	Vitamins: their functions and good food sources	108
Part 2	Minerals: their functions and good food sources	115

**Topic 3** How to eat well for good health 137

**Lesson 6** Meeting nutritional needs throughout life 139

- Part 1 Nutritional needs in pregnancy and breastfeeding 140
- Part 2 Nutritional needs of babies and infants (0–24 months) 145
- Part 3 Nutritional needs of children 2–10 years 149
- Part 4 Nutritional needs of adolescents (11–17 years old) 151
- Part 5 Nutritional needs during illness 155
- Part 6 Nutritional needs of older people 157

**Lesson 7** Making good food choices and healthy meals 187

- Part 1 Eating habits and healthy diets 189
- Part 2 Shopping for good foods 196

**Lesson 8** Keeping foods safe and nutritious 225

- Part 1 Food quality and safety in the shops, markets and streets 226
- Part 2 Protecting the quality and safety of food at home 229

**Topic 4** Healthful habits and lifestyles 249

**Lesson 9** Achieving healthy body size and weight 251

- Part 1 Achieving and maintaining a healthy body size 252

**Lesson 10** Keeping fit and active 275

- Part 1 Being fit and active 276

**Lesson 11** Keeping ourselves, our water and our surroundings clean 287

- Part 1 Personal hygiene: keeping our bodies clean 288
- Part 2 Clean and safe water 293
- Part 3 Clean living conditions 298

## List of materials

### Topic 1 What it means to be healthy and well-nourished

#### Lesson 1 Exploring the meaning of good health and well-being

- Work sheet: Proverbs and sayings about health 11
- Work sheet: Making a contribution despite health problems 12
- Work sheet: Personal choices affecting our health 13
- Example work: sheet Personal choices affecting our health 14
- Example work sheet: Basic public services 15
- Work sheet: Community services and people's health 16
- Into the field work sheet: How does your community rate? 17

#### Lesson 2 Analysing the conditions that affect nutritional status

- Quiz work sheet: Nutritional status: true or false? 29
- Work sheet: Fundamental conditions for good nutritional status 30
- Example work sheet: Fundamental conditions for good nutritional status 31
- Match it work sheet: Malnutrition facts matching 32
- Quiz work sheet: Malnutrition: true or false? 33
- Work sheet: Vicious cycle of poverty and malnutrition 34
- Example work sheet: Vicious cycle of poverty and malnutrition 35
- Work sheet: An emergency happened in our town 36

#### Lesson 3 Understanding problems of poor nutrition

- Match it work sheet: Undernutrition facts matching 51
- Fact sheet: Problems of poor nutrition and their signs and effects 52
- Match it work sheet: Linking deficiencies with health problems 55
- Quiz work sheet: Lack of micronutrients: true or false? 56
- Quiz work sheet: Micronutrient deficiency facts 57
- Fact sheet: Iron deficiency anaemia 59
- Fact sheet: Iodine deficiency 62
- Fact sheet: Vitamin A deficiency 65
- Example work sheet: Good food sources of iron, iodine and vitamin A 68
- Work sheet: Problems related to obesity 69
- Quiz work sheet: Overweight and obesity: true or false? 70

## Topic 2 What we get from food

### Lesson 4 Learning about carbohydrates, protein and fats

- Fact sheet: Basic macronutrient facts: carbohydrates 87
- Ask yourself work sheet: Carbohydrates in my diet 88
- Answer work sheet: Carbohydrates in my diet 90
- Match it work sheet: Carbohydrates facts matching 92
- Work sheet: Carbohydrates around the world 93
- Fact sheet: Basic macronutrient facts: protein 95
- Ask yourself work sheet: Protein in my diet 96
- Answer work sheet: Protein in my diet 97
- Work sheet: Foods rich in protein 98
- Work sheet: Protein around the world 99
- Fact sheet: Basic macronutrient facts: fats 101
- Ask yourself work sheet: Fats in my diet 102
- Answer work sheet: Fats in my diet 103
- Work sheet: What foods are high sources of fats? 104
- Work sheet: Fill in the gaps 105
- Match it work sheet: Macronutrients facts matching 106

### Lesson 5 Learning about vitamins and minerals

- Fact sheet: Vitamins, their functions and good food sources 121
- Ask yourself work sheet: Vitamins in my diet 124
- Answer work sheet: Vitamins in my diet 126
- Match it work sheet: Vitamins matching game 127
- Quiz work sheet: Vitamins: Who am I? 128
- Fact sheet: Minerals, their functions and good food sources 129
- Ask yourself work sheet: Minerals in my diet 132
- Answer work sheet: Minerals in my diet 134
- Match it work sheet: Minerals matching game 135
- Quiz work sheet: Minerals: Who am I? 136

## Topic 3 How to eat well for good health

### Lesson 6 Meeting nutritional needs throughout life

- Fact sheet: Nutrition during pregnancy and breastfeeding (mother) 160
- Fact sheet: Weight gain during pregnancy 162
- Match it work sheet: Maternal health 163
- Work sheet: Good foods to eat during pregnancy 164
- Work sheet: Eating well during pregnancy 166
- Fact sheet: Breastfeeding babies (0–6 months) 167
- Work sheet: Personal childhood timeline 168



Into the field work sheet: Community interview 169  
 Fact sheet: Nutrition of children 6 months – 2 years 170  
 Work sheet: Start the day right 172  
 Work sheet: Colourful lunch bags 173  
 Fact sheet: Nutrition of school-age children 174  
 Work sheet: My food diary 176  
 Ask yourself work sheet: How good is your diet? 177  
 Work sheet: My meal analysis 179  
 Work sheet: Help Andrew pack his lunch 180  
 Fact sheet: Good nutrition and HIV/AIDS 181  
 Match it work sheet: Feeding sick people 183  
 Ask yourself work sheet: Keeping healthy in older age 184  
 Answer work sheet: Keeping healthy in older age 185

**Lesson 7 Making good food choices and healthy meals**

Ask yourself work sheet: My food choices 200  
 Work sheet: Why do people eat the foods they eat? 201  
 Fact sheet: Food-based dietary guidelines 203  
 Ask yourself work sheet: Analysing dietary guidelines 212  
 Work sheet: My food guide for better health 214  
 Work sheet: Mixed meal model 215  
 Work sheet: Eating traditions around the world 217  
 Match it work sheet: Food shopping and meal planning 218  
 Quiz work sheet: Food choices: true or false? 219  
 Work sheet: My seasonal fruits 220  
 Work sheet: My seasonal vegetables 221  
 Work sheet: Reading food labels 222  
 Fact sheet: Understanding and using food labels 223

**Lesson 8 Keeping foods safe and nutritious**

Fact sheet: Basic conditions for selling food 232  
 Fact sheet: Choosing good quality foods 233  
 Match it work sheet: What to look for when buying food 235  
 Into the field work sheet: Food safety inspection – fresh fruits and vegetables 236  
 Into the field work sheet: Food safety inspection – dry, non-perishable foods 237  
 Into the field work sheet: Food safety inspection – fresh, perishable foods 238  
 Fact sheet: Recognizing signs of spoiled, poor quality foods 239  
 Quiz work sheet: Recognizing signs of good or spoiled food 240  
 Into the field work sheet: School canteen inspection 242  
 Fact sheet: Prepare and cook food properly 243  
 Fact sheet: Store food properly 244  
 Match it work sheet: Tips on how to preserve nutrients in foods 245  
 Into the field work sheet: Household food safety inspection 246  
 Work sheet: Jumbled foods 248

## Topic 4 Healthful habits and lifestyles

### Lesson 9 Achieving healthy body size and weight

- Fact sheet: How is BMI calculated and interpreted? 259
- Work sheet: Calculating and evaluating adult body size 260
- Example work sheet: Child BMI and growth charts 261
- Work sheet: Evaluating children's growth and weight 266
- Work sheet: Fill in the gaps 267
- Ask yourself work sheet: Calculating energy balance 268
- Answer work sheet: Calculating energy balance 271
- Fact sheet: Energy balance equation 273

### Lesson 10 Keeping fit and active

- Ask yourself work sheet: Health benefits of physical activity 279
- Answer work sheet: Health benefits of physical activity 280
- Ask yourself work sheet: Understanding activity levels 281
- Ask yourself work sheet: Aerobic, strengthening and stretching activities 282
- Example work sheet: Aerobic, strengthening and stretching activities 283
- Ask yourself work sheet: My physical activity 284
- Fact sheet: Intensity levels of physical activity 285

### Lesson 11 Keeping ourselves, our water and our surroundings clean

- Fact sheet: The truth about germs 302
- Quiz work sheet: Germs: true or false? 305
- Fact sheet: 12 steps to good hand washing 306
- Match it work sheet: Proper hand washing 308
- Ask yourself work sheet: My personal hygiene 309
- Fact sheet: Keeping yourself clean and free from germs 310
- Fact sheet: Basic facts about water 314
- Match it work sheet: Water facts matching 318
- Fact sheet: Easy ways to make water safe to drink 319
- Fact sheet: Health problems from unsafe water 322
- Ask yourself work sheet: How clean is my water? 324
- Into the field work sheet: How good is your community water supply? 326
- Quiz work sheet: Clean living conditions: true or false? 327
- Fact sheet: Basic practices for a clean and safe home 328
- Fact sheet: Basic practices for a clean and safe community 330
- Ask yourself work sheet: Home inspection 332
- Into the field work sheet: Investigation: How clean and safe is my school? 335
- Into the field work sheet: How clean is my community? 338

## Foreword

Everyone wants to be healthy and lead a full, active life. And most people know that to help them be healthy, they need to eat properly. Yet, many people make their food choices for reasons other than good nutrition and health. The availability of foods and their cost are often the primary considerations for people's food choices, but there are many other almost equally important reasons why people eat the foods they eat. Time constraints and convenience, religious practices and cultural traditions, personal likes and dislikes, everyday habits and lack of knowledge and skills all affect people's food choices. Whatever the reasoning behind them, the food choices that people make can have long-lasting effects on their health and well-being.

Around the world, millions of people suffer the consequences of poor diets. Diets that provide less food than people need, or an inadequate variety of foods or more food than people need may all lead to potentially serious health and medical conditions which can handicap people for life. Many of these problems can be prevented by eating a varied, nutritionally adequate diet. Tragically, some of these problems, such as blindness in children resulting from vitamin A deficiency, are not reversible once they happen, although they are preventable through proper diets.

To eat well for good health, people need the knowledge and the practical skills to make the best food choices possible and to practise good, life-long eating habits. Both in circumstances where food choice is limited and where food choice is seemingly limitless, understanding the body's food needs and knowing the nutritional value of foods can help people prepare more healthful meals and follow good diets.

Even with the best of intentions, however, it is not always so easy for people to know which food choices or dietary practices are the best for them. Access to scientifically sound and easily understandable information on nutrition and diets is often a problem. For some people, there is little or no information available; for others there may be too much or conflicting information. Nutritional science is constantly developing, sometimes creating confusion among consumers, as new discoveries replace previous information and advice. In the media and on the web, information on diets and nutrition abounds, much of it not adequately interpreted and some of it not scientifically well-founded. And much information, good and bad, is passed around informally, as people share their own theories on nutrition and healthy diets.

It is to address this lack of good information on healthy diets and eating habits that these lessons have been developed. The lessons provide a simple presentation of basic information on food, nutrition and health to help people understand the connection between what they eat and their health. The purpose is not to train people to be nutritionists, but to help them improve their everyday skills in making good food choices, planning and preparing healthful meals, protecting the quality and safety of the foods they eat and in establishing healthful personal habits and lifestyles.

Aimed primarily at the middle and secondary school level, the lessons can be used by students and teachers in the classroom, individuals outside the classroom and by groups in non-formal settings. The approach is activity-based, with less emphasis on reading and more on learning by doing, with a variety of activities, exercises, investigations and analysis that can be done in groups or individually. In all, over 140 activity sheets and fact sheets are provided to help make learning easier and, it is hoped, more enjoyable.

The lessons were originally designed for the web, in order to reach a wide audience. The print version has been prepared with the recognition that many users and most classrooms around the world do not have easy access to computers and the internet. Readers are invited to also visit and use the web version of the Eating well for good health lessons on the *Feeding Minds, Fighting Hunger* website <http://www.feedingminds.org/fmfh/nutritionlessons>.

While it is best if good eating habits start at an early age, so that they can be practised throughout life, good habits can be acquired at any age. It is never too late to gain health benefits from following a balanced, varied and nutritionally adequate diet. It is hoped that these lessons will provide a basic foundation to help and encourage people of all ages to eat well and be as healthy as they can be.

**Valeria Menza**

*Nutrition Education and Consumer Awareness  
Nutrition Division, FAO*

## Acknowledgements

The authors would like to acknowledge with gratitude the invaluable contributions made by many to the development of these lessons. Very special thanks are due to Maria Volodina, Youth Education Consultant, who contributed to the development of the module structure, the activities and their accompanying hand-out materials. She was also responsible for overseeing the testing in schools and among youth groups. Her endless patience and enthusiasm through all the various stages of development are greatly appreciated.

We would like to express our appreciation for the technical review and contributions provided by Maria Teresa Machiavelli Oyarzún, Nutrition Consultant, and William D. Clay, Visiting Professor, Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee.

Many teachers, youth leaders and students taking part in an extensive testing and review process contributed directly or indirectly to the development of the lessons. In particular, we thank Penn State University Nutritional Sciences Program students; Alan Heskins, nutrition intern to FAO; students and teachers from the Rome international schools; World Association of Girl Guides and Girl Scouts (WAGGGS) leaders and youth groups around the world.

Special acknowledgements are due to Chiara Caproni for the graphic design, illustrations and layout, in collaboration with Monica Umena, and to Giulia Ruspantini for the design of the web version, in collaboration with the FAO Web Guide Team. Their efforts to make the lessons attractive and easy to use have greatly enhanced these materials and are much appreciated. Our thanks go also to Jayne Beaney for her assistance in checking the final submission.





## Introduction

**Welcome** to *Eating well for good health*, a learning module designed to explore basic concepts of good nutrition, health and healthy diets. Eating well helps keep us healthy and active and thus improves our enjoyment of life. Good diets and eating habits are fundamental for proper growth and development and for the prevention of disease. Poor diets and poor nutrition can lead to a number of different and very serious health problems. Many of these problems handicap people for their entire lives; some of them lead to death. Learning how to meet our nutritional needs throughout life by making good food choices for a healthful, balanced diet can help us prevent some very debilitating health problems caused by poor nutrition.

Eating well for good health requires a basic knowledge of foods and the nutrients they provide and an understanding of our nutritional needs throughout the various stages of life. With this knowledge we can practise good, life-long eating habits that will help us be as healthy as we can be.

These lessons are meant for anyone who wants to learn how to improve their diets and eating habits. While oriented toward use in the classroom, the lessons can also be used by groups outside the classroom, such as youth groups or community or religious groups, and by individuals who want to learn on their own. The intended classroom level is middle and secondary school students. In non-formal settings outside the classroom, the lessons are appropriate for individuals or groups with an educational or learning ability at this level or higher. Teachers and youth and community group leaders are encouraged to adapt the lessons to fit the needs of their particular age-group and circumstances. All users are welcome to use the web version of the lessons at <http://www.feedingminds.org/fmfh/nutritionlessons>

Four main topics have been selected to explore and learn: 1. *What it means to be healthy and well nourished*; 2. *What we get from food*; 3. *How to eat well for good health*; and 4. *Healthful habits and lifestyles*. Each topic includes 2 or 3 separate lessons, each of which has an overview, learning objectives, questions to think about while reading, reading content, activities and accompanying materials and key points to remember. The complete module, covering all four topics, includes a total of eleven lessons.

## Module structure and content overview



**Topic 1 What it means to be healthy and well-nourished** is about the many factors that affect our health and well-being. It explains how our nutritional status depends both on our personal choices and on fundamental conditions such as nutritious food, clean water, medical care and education. It shows how poverty is an underlying cause of most forms of malnutrition and discusses the serious health problems caused by poor nutrition. It describes the most common problems of poor nutrition, their signs and symptoms.

**Lesson 1** Exploring the meaning of good health and well-being

**Lesson 2** Analysing the conditions that affect nutritional status

**Lesson 3** Understanding problems of poor nutrition



**Topic 2 What we get from food** is about the nutrients we get from foods and how important it is for proper growth and development and prevention of disease to eat the right variety and the right amounts of foods that provide these nutrients. It explains the functions of carbohydrates, protein, fats, vitamins and minerals in the body and their importance in the diet. It provides some examples of foods that are good sources of these nutrients.

**Lesson 4** Learning about carbohydrates, protein and fats

**Lesson 5** Learning about vitamins and minerals



**Topic 3 How to eat well for good health** is about how to make good food choices for a healthy balanced diet throughout life. It describes the different nutritional needs at different stages of life and discusses the importance of developing good dietary practices and eating habits. It includes practical advice on how to choose clean, fresh and nutritious foods and how to store and prepare them safely at home.

**Lesson 6** Meeting nutritional needs throughout life

**Lesson 7** Making good food choices and healthy meals

**Lesson 8** Keeping foods safe and nutritious



**Topic 4 Healthful habits and lifestyles** is about how body weight, physical activity, good personal hygiene and clean surroundings affect our health. It explores what a healthy body size is and how to achieve a healthy weight by keeping energy in balance. It discusses the importance of physical activity and fitness for good health and weight. It explains how protecting ourselves from germs that cause disease is an important part of keeping well and healthy.

**Lesson 9** Achieving healthy body size and weight

**Lesson 10** Keeping fit and active

**Lesson 11** Keeping ourselves, our water and our surroundings clean



## How to use the lessons

The *Eating well for good health* lessons can be used both in the classroom by students and teachers, and outside the classroom by groups of people or individual learners exploring the issues of health and nutrition on their own. Every lesson contains each of the sections below. Longer lessons covering several different concepts are divided into separate lesson parts, each one with its own lesson reading, questions to think about, materials, activities and key points. It is suggested that each lesson part be taught or studied as a separate lesson.

The full lessons are available on the website, where additional copies of all of the materials can be downloaded in PDF and printed (<http://www.feedingminds.org/fmfh/nutritionlessons>).



### LESSON OVERVIEW

Every lesson starts with a short summary of the information presented in that lesson. Teachers can use the overview to introduce the main concepts of the lesson to their students, while individual learners can review it to understand what the lesson is about.



### LEARNING OBJECTIVES

This section lists things learners should know and be able to do by the end of the lesson. It can be used during the lesson to remind students of the skills they are to learn and to help them focus their attention on the main issues. It can also be reviewed at the end of the lesson to evaluate the knowledge, skills and attitudes that have been acquired.



### READING

This section contains the basic reading material that provides the core information of each lesson part. The reading should be printed out, projected on walls or screens or copied in notebooks, on blackboards or flipcharts. It can be read individually, in groups or aloud to the whole class. The text should be studied and discussed before doing the activities.



### TO THINK ABOUT WHILE READING

This section contains key questions to reflect on before, during and after reading the text. Teachers can use these questions to introduce the “Reading” or as a starting point for discussion and exchange of opinions on the topic of the lesson. Individual learners can use the questions to reflect on the concepts presented in the lesson.



### ACTIVITIES

A range of different types of activities – individual thinking and analyses, group discussions, matching games, quizzes, true or false statements, community research and assessment – is provided for people to choose from depending on their ability, needs, interests and time. The activities are based on the “Reading” and are designed to help learners test their understanding of the basic concepts of the lesson and apply it to their own lives. Most of the activities can be carried out with limited resources and can be done by both individual and group learners. Teachers can also create new activities to suit their students’ needs and cultural backgrounds.



### MATERIALS

A number of fact sheets, work sheets, exercises, quizzes and other materials are provided for each lesson. They can be adapted and enriched according to the needs of the learners and the settings in which they are being used. Some of the materials contain additional, more detailed information to complete the “Reading” section that can be used as a handy reference or as information to take home from school or share with others. Other materials are designed to be used as work sheets during the activities. They should be printed out or copied in notebooks, on blackboards or flipcharts so that they can be completed in groups or individually.



### KEY POINTS

Every lesson part concludes with the key points to understand and remember. These points can be used for discussion and further investigation of the topics presented in the lesson section. They can also be used to evaluate learners’ understanding of the topic. Groups and classes can use them as “take home” messages to share with family and friends.

# Eating well for good health

Lessons on nutrition and healthy diets





# What it means to be healthy and well-nourished



What it means to be healthy and well-nourished is about the many factors that affect our health and well-being. It explains how our nutritional status depends both on our personal choices and on fundamental conditions such as nutritious food, clean water, medical care and education. It shows how poverty is an underlying cause of most forms of malnutrition and discusses the serious health problems caused by poor nutrition. It describes the most common problems of poor nutrition, their signs and symptoms.



**Lesson 1**  
Exploring the meaning of good health and well-being



**Lesson 2**  
Analysing the conditions that affect nutritional status



**Lesson 3**  
Understanding problems of poor nutrition



## Topic 1

What it means  
to be healthy  
and well-nourished



### LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- name and explain the three dimensions of health;
- provide examples of personal choices that can improve or harm our health;
- identify and explain other factors that also affect our health.

### Lesson 1

# Exploring the meaning of good health and well-being

### LESSON OVERVIEW



This lesson is about trying to be as healthy as we can be and living a happy, active

life. It describes the three dimensions of

health – physical, mental and social – and encourages reflection and discussion about our bodies, minds and emotions. It shows how developing good habits and making good personal choices can improve our health and well-being, while poor habits can harm it.

It also explains that not all factors affecting our health are under our personal control, and that efforts by both individuals and the community are necessary for achieving good health. The lesson encourages an evaluation of the basic local public services that affect people's health.



## Part 1

# The dimensions of health



### READING

Being in good health means more than just being free from illness or disease. While being physically healthy is the first step to good health, good mental health and social well-being are also necessary. In fact, health is defined by the World Health Organization as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. This means that to be in good health, we must take care of our bodies, our minds and emotions, and we must pay attention to our life-styles and surroundings. This definition of health recognizes that every person is complex and must be valued for all of their dimensions, not just for their physical ones. For example, people with a physical disability or illness can still continue to grow and improve mentally or socially, thus maintaining a good quality of life and contributing to the family and community. We have a chance to be in the best health when we are aware of all dimensions of good health and when we work toward improving ourselves in as many of them as we can.

#### TO THINK ABOUT WHILE READING



What does being healthy mean to you?

Is it enough to just be free from illness or disease to be in good health? Why or why not?

How can people improve their physical and mental health and their social well-being?

Are you aware of how your habits and personal choices affect your health and well-being?

There are many personal choices we can make to improve our physical, mental and social well-being. What we eat, how we live and the physical and social environment in which we live and work all affect our health. Achieving and maintaining the best possible overall health and well-being requires learning how to make good personal life-style choices and continuing these good practices throughout life. This means first of all making good food choices for a healthy and nutritious diet. It also means adopting behaviours that are beneficial to health, such as practising adequate levels of physical activity, and avoiding harmful behaviours such as smoking, drug and alcohol abuse and exposure to sexually transmitted diseases.

How we react to the challenges we face in life determines our mental health and happiness. Facing problems in a positive way, overcoming barriers, trying to make the best of a situation and seeking solutions all contribute to good mental health and well-being. The following saying suggests some positive attitudes for facing challenges and difficulties in life: “...have the serenity to accept the things we cannot change; the courage to change the things we can; and the wisdom to know the difference”.





**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 1**  
Exploring the meaning  
of good health  
and well-being








**Part 1**  
The dimensions  
of health

Not all factors affecting our health are under our personal control. While we can control and be responsible for some of the important factors that affect our health, we do not always have control over all of them. Our health also depends on factors such as having good health services and medical care, public sanitation, a clean water supply, a safe and adequate food supply, job opportunities, good housing, good schools, peace and security, and recognition of our basic human rights.

Improvements in our health are best achieved and maintained by improving the personal choices we make as individuals and strengthening the efforts of the community to create a healthful environment and provide adequate public goods and services. Total health for an individual or a community is a combination of personal and public responsibility. While each person needs to learn how to make personal choices to ensure the very best health, the community needs to provide basic services that help protect or improve our health. Efforts by both the individual and the community are necessary for achieving improvements in overall health and well-being. People can contribute to improving their community services through volunteering, becoming involved in decisions that affect community services and being active in local community committees, citizen groups or political associations.



### MATERIALS

-  Work sheet *Proverbs and sayings about health*
-  Work sheet *Making a contribution despite health problems*
-  Work sheet *Personal choices affecting our health*
-  Example work sheet *Personal choices affecting our health*
-  Example work sheet *Basic public services*
-  Work sheet *Community services and people's health*
-  Into the field work sheet *How does your community rate?*



### ACTIVITIES

#### What do we mean by good health?

Reflect on what being healthy means to you. Write your ideas of health and well-being on a sheet of paper or on a board.

Then write out the WHO health definition: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or



infirmity”. Compare it to your responses and explore the concept of good health according to this definition. Were you able to think of responses for all three dimensions?

If working in a group or classroom setting, share your ideas and discuss.

## Sound mind in sound body

Health is so important for everyone that many cultures have proverbs and sayings defining health and highlighting its physical, spiritual and mental dimensions. For example, an ancient Roman poet once wrote that to be healthy we need to have a ‘sound mind in a sound body’ (*Mens sana in corpore sano*). What does this mean to you? Do you agree? How does this compare with the WHO definition?

Go to the *Proverbs and sayings about health* work sheet for more examples of popular proverbs and sayings. What do they mean to you? Do you agree with them?

Find and add to the list as many local proverbs, sayings and expressions relating to all dimensions of health and well-being as possible. You may also contribute some special expressions you often say or hear in your families. Compare the proverbs to the WHO health definition and identify which dimensions (our bodies, minds or emotions) are addressed in them.

## Being as healthy as possible in difficult life situations

Think about how to be as healthy as possible, even when things are difficult. Consider the following questions:

- Are sick people always sad?
- Do you know someone who has a health problem and yet is happy and active in the family or the community?
- What can we learn from these people?
- Could you be happy if you had an injury, disability or illness?
- How could you make the best of this situation?

Use the *Making a contribution despite health problems* work sheet to research and share with others the stories of people who have made important achievements and contributions to society despite their illnesses and disabilities. Examples may include world leaders who had health disorders, composers unable to hear their music, singers unable to see their instruments, the Paralympic Games athletes, disabled painters, scientists and others.

Think and add to the list people in your own family or community who have overcome physical or mental disabilities, humble beginnings or difficult circumstances and have made a contribution to the community or have had a positive influence on others.



## What personal choices affect our health?



Look at the blank work sheet *Personal choices affecting our health* individually or in small groups and think about the personal choices you make that can affect your health.

Name some things you can do that are healthful for each of the three dimensions and write them in the table. For example, some healthful choices may include: not smoking, being active, keeping the body clean, being relaxed, feeling good about oneself, making friends, helping others, and getting involved in the community.

Then add some behaviour choices that are harmful for the physical, mental and social dimensions. They may include: drug and alcohol abuse, eating poorly, lack of physical activity, being angry or sad, gossiping, hurting people, lying.



Now compare your ideas to the example work sheet *Personal choices affecting our health* and add as many suggestions as possible.

Looking at your work sheet, identify areas in which you feel you need to change or improve your behaviour in order to achieve better health. Choose one behaviour for each dimension and make an “agreement” with yourself on how you can improve.

## What community services affect health?



Make a list of community services that affect our physical, mental and social health but are not always under our personal control. Compare your ideas with the example list of *Basic public services*. Did you think of any services that are not on the list? Are there any services on the list that you didn't think of?

Then, individually or in groups, choose one or two basic services to further explore. Using information available from newspapers, magazines, radio, television, personal experience or any other sources available, describe some real situations happening anywhere in the world in which lack of community and public services affects people's health and well-being.



Fill in the Work sheet *Community services and people's health* with as much information as you can collect. Present and discuss the findings with your class, family, friends or others.

## How does your community rate?



Use the *How does your community rate* work sheet to evaluate the basic public services in your community that affect people's health and make suggestions for improvements. The evaluation can be done by interviewing knowledgeable people and experts in the community, such as local leaders, associations and community groups, health and social workers, religious leaders, elders, local authorities and government ministries. What opportunities do people have to influence decisions affecting their health? What can each of us do to help improve the public services?



**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 1**  
Exploring the meaning  
of good health  
and well-being

**Part 1**  
The dimensions  
of health

Prepare a report or a presentation for your school, family and community with the results of your analysis, suggestions for improvements and actions that can be taken. For example, if health care service is a problem, you might suggest community organization for transportation to hospitals or health centres or for bringing in medicines to families in need. If sanitation is a problem, you could identify the causes and indicate this to community leaders. If sufficient food is not available for everyone, you could suggest setting up food donations or food banks, community gardens, organizing transportation and facilities for food markets, or helping people get to food markets and shops.

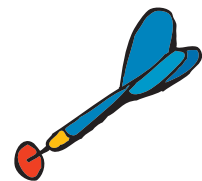


### KEY POINTS

**Review these three key points** to remember about what it means to be in good health. Check your understanding of them and see how you can apply it to your own life.

### Good health and well-being

- Health is a state of complete physical, mental and social well-being and not just the absence of disease or infirmity.
- Good health depends on making positive personal choices, including eating nourishing food, being physically active, and avoiding unhealthy habits, such as smoking, drug and alcohol abuse and risky sexual practice.
- Good health is best achieved through the combined efforts of the individual and the community which provides those services which help protect or improve health.





# Proverbs and sayings about health

How many proverbs, sayings or expressions about health do you know? List as many as you can think of.

*“Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”*

## Popular proverbs about health and well-being

- Sound mind in a sound body.
- Health is wealth.
- He who has health has hope, and he who has hope has everything.
- An apple a day keeps the doctor away.
- Early to bed and early to rise, makes a man healthy, wealthy and wise.

## Your proverbs and sayings

- .....
- .....
- .....
- .....
- .....
- .....





# Making a contribution despite health problems

**Do you know someone who has overcome a physical or mental disability or difficult circumstances and has made a contribution to the community? List as many people as you know.**

## Some people who have made important contributions despite illness and disability

- American President **Franklin Roosevelt** was paralyzed from the waist down and sat in a wheelchair.
- German music composer, conductor and pianist **Ludwig Van Beethoven** was completely deaf.
- The great physicist and philosopher **Albert Einstein** was affected by dyslexia.
- Russian writer **Fedor Dostoevskij** had epilepsy (seizures or convulsions) throughout his life.
- Italian politician and social activist **Antonio Gramsci** had a spinal deformity (hunch back).
- American singer and song-writer **Stevie Wonder** has been blind since birth.

## People in your family and community who are active despite illness and disability

- .....
- .....
- .....
- .....
- .....
- .....



# Personal choices affecting our health

How do your personal choices affect your health? List some things you can do that are healthful for your physical, mental or social well-being and some things that are harmful.

*“Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”*

**Healthful choices**

**Harmful choices**

**Physical health**

**Physical health**

- .....
- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....
- .....

**Mental health**

**Mental health**

- .....
- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....
- .....

**Social health**

**Social health**

- .....
- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....
- .....



★ You can look for more information on Work sheet example **Personal choices affecting our health**

# Personal choices affecting our health

*“Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”*

## Healthful choices

### Physical health

- Not smoking, avoiding smoke
- Keeping the body clean
- Being active
- Eating a healthy balanced diet
- Getting proper care when sick

### Mental health

- Prayer and meditation
- Positive thinking
- Being cheerful and enthusiastic
- Being relaxed and reducing stress
- Feeling good about oneself
- Courage
- Forgiveness

### Social health

- Sharing with others
- Helping others
- Being kind, respecting others
- Making friends and being friendly
- Being responsible
- Joining social groups and clubs
- Being honest and sincere
- Volunteering
- Learning new skills
- Participating in the community

## Harmful choices

### Physical health

- Abuse of drugs and alcohol
- Smoking
- Eating poorly
- Unprotected sex
- Lack of physical activity or exercise

### Mental health

- Being bitter or angry
- Being irritated
- Holding a grudge
- Feeling hate
- Feeling fear
- Being anxious

### Social health

- Gossiping
- Fighting
- Having few friends
- Isolating yourself
- Being a bully
- Hurting people
- Lying and cheating
- Stealing



★ Reading this example work sheet will help you complete Work sheet Personal choices affecting our health



# Basic public services

- Health care services: hospitals, clinics, health centres, doctors and medicines, public vaccination programme for children
- Clean water supply
- Adequate food supply: food markets and shops
- System and laws to oversee and ensure food safety
- Provision of public sanitation: sewage system
- Rubbish collection and disposal facilities
- Building standards and safe housing construction
- Public housing, supported housing, rent control
- Employment opportunities, jobs and income
- Good public schools for all children
- Health education programmes for families
- Social support and protection for the old, the disabled, pregnant women, children and care-givers
- Clean environment: land, air and water
- Parks, gardens, playgrounds and sport facilities
- Places for people to meet and stay together
- Peace and security

## Examples of situations in which lack of public services affects people's health and well-being

- Shortage of hospitals, clinics, doctors, medicines, vaccines
- Problems with the supply of clean water
- Shortage of schools and teachers
- Few job opportunities
- Poor housing and living conditions
- Polluted land, air and water
- Inadequate food supplies and systems



★ Reading this example work sheet will help you complete Work sheet Community services and people's health



# Community services and people's health

Description of the situation	Impact on people's health	Solutions	Lessons learnt
<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

**Find out more about the basic services in your community.**

**Choose 1 or 2 services to investigate and fill in this table with as much information as possible.**

**Your findings should include:**

- Description of the situation.** What basic public services are not provided in the community? Why are they not provided? Who takes decisions about the provision of these services?
- The impact on people's health.** How does the lack of basic public services affect people's health and well-being?

**3) Solutions.** Has the problem been solved? How? Who has taken action to resolve the situation? Are there any other ways to improve these public services?

**4) Lessons learnt.** What have you learned from this situation that can be useful in your own community?



**You can look for more information on**

**Basic public services**

Work sheet example

# How does your community rate?

**Interview knowledgeable people and experts in the community, such as local leaders, associations and community groups, health and social workers, religious leaders, elders, local authorities and government ministries.**

What opportunities do people have to influence decisions affecting their health? What can each of us do to help improve the public services?

**Prepare a report or presentation with the results of your analysis, suggestions for improvements and actions that can be taken.**

For example, if health care service is a problem, you might suggest community organization for transportation to hospitals or health centres or for bringing in medicines to families in need.

If sufficient food is not available for everyone, you might suggest setting up food donations or food banks, community gardens, organizing transportation and facilities for food markets, or helping people get to food markets and shops.

**Your interview should include:**

1. identifying any problems in the provision of public services;
2. understanding how these problems affect people's health;
3. evaluating or rating the basic services in the community;
4. making suggestions for actions to improve the situation through efforts by both individuals and the community.

**Examples of the interview questions:**

- What kind of ..... is provided in your community? (Add a public service from the list "Basic public services")
- Is it good? Poor? So so?
- How would you "rate" the provision of this basic service?
- What are some of the problems?
- How do these problems affect people's health?
- How could this public service be improved?
- What are some of the difficulties in improving it?
- How could improvement in this public service have a positive effect on people's health?
- Who should be taking action to improve this public service in your community?





## Topic 1

What it means  
to be healthy  
and well-nourished



## LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- explain how adequate food, health, knowledge and care are fundamental conditions for good nutritional status;
- understand that poverty is the underlying cause of much malnutrition and give examples of how poverty and malnutrition affect each other;
- explain how poor nutritional status affects people, families and communities.

## Lesson 2

# Analysing the conditions that affect nutritional status

## LESSON OVERVIEW



This lesson is about the conditions that are necessary for people to have good nutritional status and what conditions

can cause poor nutritional status and malnutrition. It explores the many things we need for good nutritional status: enough food to eat to meet our nutritional needs; clean water and living conditions to help us avoid disease; medical care to help prevent and treat disease; and the knowledge and ability to feed and care for ourselves and our families properly. It discusses the causes of poor nutritional status and how malnutrition affects people's lives and explains how poverty is the underlying cause of much malnutrition in the world.



**Part 1**

# Fundamental conditions for good nutritional status



## READING

Good nutritional status helps us maintain all important body functions so that we can grow and develop properly and lead healthy, active lives. Nutritional status is the condition of the body resulting from the nutrient content of the food we eat in relation to our nutritional needs, and from the ability of our bodies to digest, absorb and use those nutrients.

In order to have good nutritional status, we need certain fundamental conditions. We need to always have enough nutritious and safe food to eat; we need clean water, good sanitation and clean living conditions; we need access to health services; and we need the knowledge and ability to feed and care for ourselves and our family. Each of these conditions is essential for good nutritional status and they often affect each other. If any of these are missing, the result can be malnutrition and disease.

## Food

The foundation for good physical health is good nutritional status. Nutritional status is directly affected by the foods we eat and their nutrient content. Good nutritional status depends on eating the right amounts and the right variety of safe, good quality foods to meet our individual nutritional needs.

Food provides the energy and nutrients needed to support all body functions, maintain good health and carry out everyday activities. Food contains many ingredients, called nutrients, which help the body function well. Foods are complex mixtures of different components, providing varying amounts of the nutrients the body needs. Most nutrients cannot be produced by the body and must be taken in adequate amounts from the food we eat in order to be healthy and prevent disease. No single food contains all the nutrients needed by the body in the right amounts; one food may be rich in one or two nutrients, but low in other essential nutrients. It is only by eating adequate amounts of a variety of foods that we can help ensure that we will take in the right amounts of the nutrients needed for good health and nutritional status.

### TO THINK ABOUT WHILE READING



How important is it to have good nutritional status?

What conditions are needed to have good nutritional status?



Individuals and families must always be able to get the food they need to be well-nourished. This means that people must be able to grow, hunt or catch the food they need or earn enough money to buy it. Food must be sufficient in both amount and variety to meet the needs of all family members. It must be safe – not contaminated or harmful to health – and of good quality – fresh, unspoiled and of good nutritional value. Food must also be acceptable to the culture of that family or household.

Producing more food in the country or community does not guarantee that people will have the food they need for good nutritional status. For example, if local shops and markets do not offer a good variety of foods, if people cannot afford the food that is available, if their diets lack the variety needed for all of the essential vitamins or minerals, if adequate food is not available in all seasons and all year long, or if food is spoiled, contaminated or unsafe to eat, people will not have the food they need for good nutritional status.

## Health, living conditions and health services

Many common infectious diseases and common parasites have a major effect on health and nutritional status; for example, diarrhoeal and respiratory diseases, measles, malaria, tuberculosis, roundworms, hookworm and HIV/AIDS. The infections themselves damage nutritional status: a person suffering from infection usually has little appetite and tends to eat less. This lack of food during illness can be a serious threat to the health of a malnourished person, who has little or no stored reserves of energy and nutrients. Poorly nourished people are likely to suffer from these diseases more often, more severely and for longer periods of time than well-nourished people. In addition, infectious diseases can increase the need for certain nutrients, and especially energy. When people have diarrhoea, their bodies lose fluids and nutrients instead of absorbing them, so their supply of nutrients gets used up very quickly. This leads to a continuing cycle of malnutrition and infection. Infections and other illnesses can worsen the state of malnutrition, and poor nutrition can worsen an infection and weaken the body's ability to fight disease.

Infectious diseases are easily spread through poor living conditions, lack of sanitation and from person to person. Clean water, effective sanitation facilities for the removal of human waste and rubbish, keeping places free from insects, rodents and parasites, and avoiding overcrowding are all necessary for reducing the risk of spreading disease. Disease is also spread by poor handling of both raw and cooked foods (called “food-borne illness”). Keeping the environment as clean as possible, practising good personal hygiene and food handling habits help decrease the spread of these diseases.



**Adequate health services are necessary for good health and better nutritional status.** By providing immunizations to help prevent disease, providing care and therapy to help people recover from illness and by proper and quick diagnosis and treatment of disease, people can suffer less from lasting effects of disease. This will also help stop the spreading of diseases throughout the community. Health care providers can also play a major role in educating the community about disease and providing information and counselling for improving and maintaining good health and nutritional well-being.

## Knowledge and care

**Knowledge about our dietary needs is essential for good health and nutritional status of the entire family.** Especially when families have few resources, understanding the food needs of each family member and knowing how best to distribute food among the family is very important. Often, family members at the most “nutrition-critical” stages, such as children and women, are the least likely to get the food they need. Without adequate knowledge, malnutrition and poor nutritional status can occur even in households with sufficient income, food, sanitation and health services.

**An incomplete understanding of the body’s nutritional needs and lack of knowledge of how to meet these needs with available foods can lead to malnutrition.** If a household does not understand the dietary needs of each member of the family or does not know how to get the most from their resources, some or all of the family members may be malnourished. Sometimes people do not know the importance of variety and balance in the diet and the right amount and types of foods needed by all family members to meet their needs. Sometimes people do not know the best way to prepare foods to get the best nutritional value. Other times, certain foods are available but are not eaten because people do not recognize their food value. Sometimes nutritionally valuable local or wild foods, which have traditionally been eaten, are no longer gathered and consumed because people consider them to be “low status” foods. And sometimes poor eating habits, food taboos and cultural or religious practices prevent people from consuming the variety of foods required to meet their nutritional needs.

**Time and ability to feed and care for ourselves and our families properly is also needed to improve the nutritional status of all members of the family.** Malnutrition can occur, especially in children, if the adults do not have enough time to provide the care and attention needed to meet the physical, mental and social needs of the growing child and other family members. While all household members may be involved in some way in providing care for the family, in many societies it is the women who are primarily responsible for deciding what foods are eaten and how they are prepared and for providing the care that is needed for children and other vulnerable (ill or elderly)



**Topic 1**  
What it means  
to be healthy  
and well-nourished



**Lesson 2**  
Analysing the conditions  
that affect nutritional  
status

**Part 1**  
Fundamental conditions  
for good nutritional  
status

family members. It is important that all family members, especially women, have the knowledge, education and time they need to provide adequate care to the family.



**For more information** on good diets and individual nutritional needs see [Lesson 6 Meeting nutritional needs throughout life](#) and [Lesson 7 Making good food choices and healthy meals](#).



**For more information** on keeping foods safe and nutritious and keeping our water, ourselves and our surroundings clean see [Lesson 8](#) and [Lesson 11](#).



### MATERIALS



Quiz work sheet *Nutritional status: true or false?*



Work sheet *Fundamental conditions for good nutritional status*



Example work sheet *Fundamental conditions for good nutritional status*



### ACTIVITIES

#### Nutritional status: true or false?



Take a quick quiz to check your understanding of some basic facts about nutritional status.

#### What fundamental conditions affect nutritional status?

Discuss or think about a person's nutritional status and what it allows us to do and write your thoughts and ideas on the board or in a notebook.

Now compare your ideas with the information from the Reading (Part 1) *Fundamental conditions for good nutritional status* which discusses how having good nutritional status depends on many things and especially on food; health, living conditions and health services; knowledge and care.



Looking at the work sheet *Fundamental conditions for good nutritional status*, note that food is a fundamental factor but not the only one affecting nutritional status. Food, health, living conditions and health services, and knowledge and care all act together to form the basis of good nutritional and health status.

Complete the work sheet by going through each of the fundamental conditions, listing as many specific examples as you can. Discuss or think about how a lack of each of these conditions can lead to malnutrition.



**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 2**  
Analysing the conditions  
that affect nutritional  
status

**Part 1**  
Fundamental conditions  
for good nutritional  
status



When finished, compare your work sheet to the example work sheet; add any specific examples for each condition and discuss.

## How do the fundamental conditions affect each other?

### *Group Activity*

Looking at your completed work sheet *Fundamental conditions for good nutritional status*, note that the arrows point in many directions: they connect the fundamental conditions and nutritional status and also connect each fundamental condition to another.

Form three groups and discuss how each of the fundamental conditions has a direct effect on each other condition, as well as on nutritional status. Each group should start with one of the fundamental conditions:

#### *Group 1. Food*

List all the benefits to a family that has enough food to meet the needs of all the family members.

#### *Group 2. Health, living conditions and health services*

List all the benefits to a family that has good living conditions, adequate sanitation and access to health services.

#### *Group 3. Knowledge and care*

List all the benefits to a family that has adequate knowledge about food handling, preservation, preparation and storage and enough care time for all family members.



### KEY POINTS

**Review these three key points** to remember about conditions that are necessary for achieving good nutritional status. Think about what you have learned and look for ways to improve some of these conditions in your own life and family.

### Fundamental conditions for good nutritional status

- Food is the foundation of good nutritional status. We need to eat the right amounts and the right variety of safe, good quality food to meet our individual nutritional needs.
- Safe water, clean living conditions, proper sanitation and health services are fundamental for preventing and treating infections and diseases which damage health and nutritional status.
- Knowledge of how to meet the body's dietary needs with available foods and the ability to provide adequate care for all members of the family are essential for improving nutritional status.

**Topic 1**  
What it means  
to be healthy  
and well-nourished



**Lesson 2**  
Analysing the conditions  
that affect nutritional  
status

## Part 2

# Malnutrition: poor nutritional status



### READING

Poor nutritional status, referred to as malnutrition, is an unhealthy state or condition in which a person's physical functions are temporarily or permanently damaged. People who are malnourished have a weakened defence against disease, become ill more easily and more frequently and are less able to recover quickly and fully from disease. Children who are malnourished fall ill frequently and are not able to grow and develop properly. All forms of malnutrition can result in serious health problems and illnesses. In severe cases, malnutrition is life-threatening; it often leads to death.

Malnutrition creates great suffering to the individual, the family and the society. It damages people's health and well-being and reduces their enjoyment of life. Malnutrition prevents people from being active members of their family and community. Malnourished children are too weak or sickly to attend school and learn properly which lowers their chances of good jobs and income in the future. Adults who are malnourished are less productive, have less energy to work, take care of their families and carry out activities of normal daily life. Malnutrition has high health care costs, as those suffering from nutrition-related illnesses require special care and treatment.

Malnutrition is caused by poor diets, illness and disease. Poor diet and disease act together, worsening the effects of each other. The combination of too little food and the presence of disease often results in malnutrition, especially in children. Poor, inadequate diets weaken the body, making disease and illness more likely. Disease, in turn, often increases the body's need for food. Repeated and prolonged illnesses, such as diarrhoea and malaria, contribute to malnutrition, as nutritional needs are higher during and following illness. Frequent episodes of illness and acute infections make it almost impossible to maintain adequate nutritional status.

Any situation that makes it difficult for people to get the food they need for themselves and their families can lead to malnutrition. Although there may be many reasons for people being malnourished, such as droughts, floods, earthquakes, failed crops, interrupted food supplies, wars,

### TO THINK ABOUT WHILE READING



What do you  
know about  
malnutrition  
and its causes?

Who is at risk of  
malnutrition?

Do you know  
anybody  
who suffers  
from malnutrition  
or have you  
experienced it  
yourself?

**Topic 1**  
What it means  
to be healthy  
and well-nourished



**Lesson 2**  
Analysing the conditions  
that affect nutritional  
status

**Part 2**  
Malnutrition:  
poor nutritional status

conflicts, civil disturbances and other emergencies, underlying much malnutrition in the world is poverty. Poverty can create situations in which people do not have enough to eat, or do not have the means to eat the variety and quality of foods they need for good nutrition and health.

**Poverty and malnutrition affect each other.** Malnutrition decreases peoples' ability to earn and provide for themselves thus creating additional poverty, which leads to even more hunger and malnutrition. This loss of human potential also results in greater social and economic costs to the community and the country. When a country has malnourished people, its economic situation also declines. Healthy people are vital to a country's economic growth and development, while sick people require additional care and resources from families and the community.



### MATERIALS



Match it work sheet *Malnutrition facts matching*



Quiz work sheet *Malnutrition: true or false?*



Work sheet *Vicious cycle of poverty and malnutrition*



Example work sheet *Vicious cycle of poverty and malnutrition*



Work sheet *An emergency happened in our town*



### ACTIVITIES

#### What is malnutrition?

Reflect on what malnutrition means to you and write your own definition of malnutrition. Does your definition include all forms of malnutrition: eating too much food, too little food or a poor variety of food?



Go to the *Malnutrition facts matching* work sheet to see if you can match some facts about the effects of malnutrition.

#### Malnutrition: true or false?



Take a quick quiz to see what you have learned about malnutrition.



## How do poverty and malnutrition affect each other?

Poverty and malnutrition affect each other to form a vicious cycle. Poverty decreases people's ability to purchase food or grow their own food, leading to malnutrition. Malnutrition decreases their ability to learn and work, leading to additional poverty.

Print or copy on a board or in a note book the work sheet *Vicious cycle of poverty and malnutrition*. Fill it in with your ideas about how poverty and malnutrition affect each other. Compare your completed work sheet with the example work sheet provided.

If you are working in a group, present your figures to your friends and discuss how malnutrition and poverty form a vicious cycle.

## How do emergencies cause malnutrition?

### *Group activity*

Poverty is the underlying, but not the only cause of malnutrition. Any emergency situation that decreases people's ability to get the food they need has a negative effect on nutritional status.

Reflect individually for a minute and identify one or two emergency situations that can cause malnutrition. If you run out of ideas refer to the list of emergency situations below.

Write the emergencies on separate pieces of paper, then fold them and put them in a bag or a box.

One at a time, pick one folded paper out of the bag. Read the emergency situation aloud and discuss what consequences it can have on people's lives and nutrition. Some examples are provided below.

### *Emergency situations:*

*earthquake / flood / drought / hurricane / cyclone / tornado / tsunami / war / conflict / epidemic disease / forest fire / pest / environmental disaster.*

### *How emergencies cause malnutrition:*

*failed or destroyed crops; no seeds to plant; interrupted food supply; no safe drinking water; people get sick; no tools to work the fields; no medicines, doctors and nurses; animals die; animals are stolen; ruined houses, farms, roads, schools, hospitals, markets; polluted water, soil, air; destroyed forest.*

## Starting over

Choose a particular emergency from the list of emergency situations above: war, earthquake, drought, hurricane, etc.

Write the major consequences of the emergency on the Work sheet *An emergency happened in our town*. You can choose from some of the examples provided in the previous activity but also come up with your own ideas: *Our house is destroyed. Our farm is burnt. Our animals are stolen. There are no*



**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 2**  
Analysing the conditions  
that affect nutritional  
status

**Part 2**  
Malnutrition:  
poor nutritional status

*doctors and nurses. There are no schools left. There is no market. The roads are ruined. Our water supply is not sufficient or safe.*

Discuss and write on the diagram the specific problems each of these creates for the families living there. For example: *We cannot grow food in our fields. We have no produce to buy or sell. We have no tools and animals to work our fields. We have no seeds to plant. We go hungry. We don't earn money. People are getting sick from the water. People are too weak from the lack of food and water to rebuild.*

Now choose one or two kinds of assistance to rebuild lives. Write these on the area of the diagram marked "Action" and add the positive effects this has on the families in the village or town.

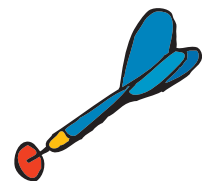


### KEY POINTS

**Review these four key points** to remember about the causes and effects of malnutrition. Check your understanding of them and see if your knowledge has improved.

## Malnutrition

- Malnutrition is an unhealthy state in which a person's body functions are damaged temporarily or permanently. Malnourished people are unable to grow and develop properly, they suffer serious illnesses and can die.
- Underlying much malnutrition in the world is poverty. Poverty and malnutrition affect each other: poverty decreases people's ability to get enough food leading to malnutrition which leads to even more poverty by limiting people's ability to work.
- Any situation that prevents people from getting the food they need, including natural and man-made disasters, can lead to malnutrition.
- Malnutrition causes much suffering to people and their families and leads to great social and economic costs for communities and countries.



# Nutritional status: true or false?

Check your understanding of some basic facts about nutritional status.

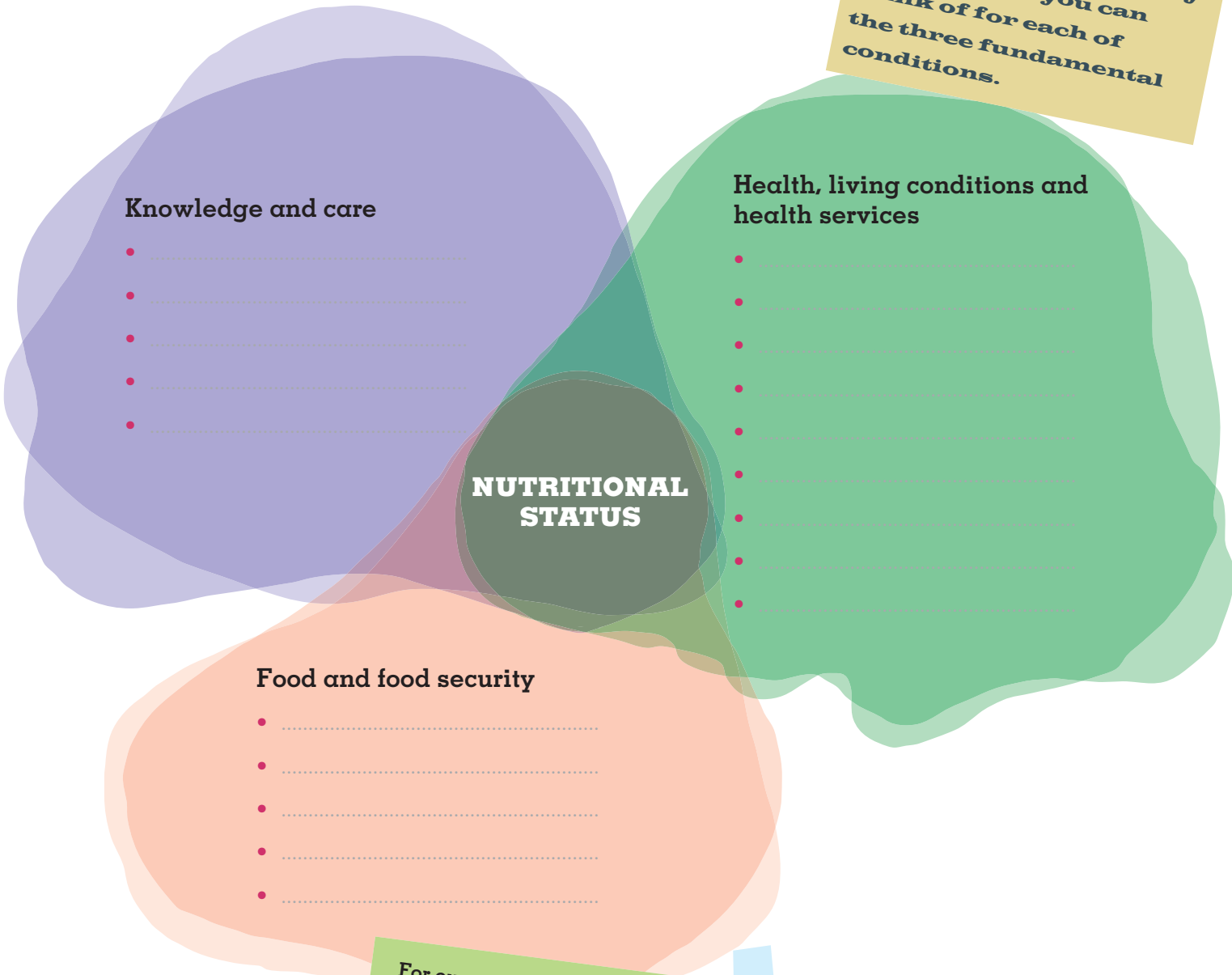
	True	False
1. Nutritional status is the condition of the body resulting from the food we eat, our nutritional needs and how our bodies use the nutrients.	<input type="checkbox"/>	<input type="checkbox"/>
2. The most basic foundation of good nutritional status is a good healthy diet.	<input type="checkbox"/>	<input type="checkbox"/>
3. Food contains nutrients which help the body function well.	<input type="checkbox"/>	<input type="checkbox"/>
4. Most nutrients can be produced by the body.	<input type="checkbox"/>	<input type="checkbox"/>
5. Disease and illness do not affect nutritional status.	<input type="checkbox"/>	<input type="checkbox"/>
6. Poorly nourished people are as likely to become ill as well-nourished people.	<input type="checkbox"/>	<input type="checkbox"/>
7. Lack of food during illness can be a serious threat to the health of a malnourished person.	<input type="checkbox"/>	<input type="checkbox"/>
8. Unsafe water and poor living conditions can lead to the spread of disease which affects nutritional status.	<input type="checkbox"/>	<input type="checkbox"/>
9. Malnutrition never occurs in families with good income.	<input type="checkbox"/>	<input type="checkbox"/>
10. Knowledge of our body's dietary needs is important for good health and nutritional status.	<input type="checkbox"/>	<input type="checkbox"/>
11. Poor eating habits and beliefs about certain foods can prevent people from meeting their nutritional needs.	<input type="checkbox"/>	<input type="checkbox"/>
12. Men do not need to learn about nutrition because they are not responsible for preparing foods and caring for children and sick or elderly relatives.	<input type="checkbox"/>	<input type="checkbox"/>



Answer key: 1 True; 2 True; 3 True; 4 False; 5 False; 6 False; 7 True; 8 True; 9 False; 10 True; 11 True; 12 False

# Fundamental conditions for good nutritional status

Complete this work sheet by listing as many examples as you can think of for each of the three fundamental conditions.



**Knowledge and care**

- .....
- .....
- .....
- .....
- .....

**Health, living conditions and health services**

- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....

**NUTRITIONAL STATUS**

**Food and food security**

- .....
- .....
- .....
- .....
- .....

**For example:**  
**Food:** lack of food that is sufficient in quantity, quality and variety will result in inadequate diet, which leads to poor nutritional status – malnutrition.  
**Health, living conditions and health services:** poor health services and lack of access to medication may cause a person's illnesses to continue, which can interfere with eating and absorbing the nutrients and foods or can increase a person's requirements for nutrients; bad water and sanitation can lead to illness and diarrhoea causing a loss of nutrients.  
**Knowledge and care:** lack of knowledge about foods, good nutrition and individual needs for nutrients can result in poor dietary habits; if the mother has to work many hours outside the home, or work too hard, she may not be able to take care of or nourish her children properly.

★ **Then, compare your work sheet to Work sheet example Fundamental conditions for good nutritional status.**  
 Add any specific examples for each condition.





# Fundamental conditions for good nutritional status

## Knowledge and care

- Knowing how to make the best food choices.
- Knowing how to share food in the family to meet everyone's needs.
- Sufficient time and knowledge to provide adequate food and care to the family.

## NUTRITIONAL STATUS

## Health, living conditions and health services

- Diseases increase nutrient needs and can decrease appetite and food intake.
- Diarrhoeal diseases increase nutrient losses.
- Lack of sanitation and poor living conditions spread diseases which can increase nutrient needs and decrease nutrient absorption and utilization.
- Health services, such as immunizations, prevent disease and provide treatment of diseases that damage nutritional status.

## Food and food security

- Food sufficient in quantity and variety for all family members.
- Safe food, free from contaminants.
- Culturally acceptable.
- Available throughout the year at affordable prices.
- Resources and tools to grow food.



Reading this example work sheet will help you to complete Work sheet Fundamental conditions for good nutritional status

# Malnutrition facts matching

Do you know some basic facts about malnutrition? See if you can match each sentence with its correct ending.

## Problems

1. Malnutrition is...
2. Malnutrition is caused by...
3. Malnutrition can lead to economic losses...
4. Malnutrition can result in education losses...
5. Malnutrition can result in health care costs...
6. Malnutrition reduces...
7. A malnourished person...
8. Malnutrition...

## Malnutrition facts

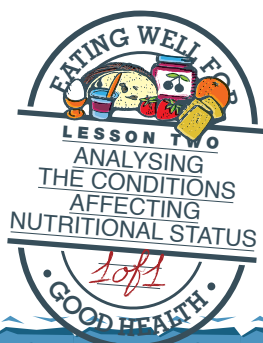
- A. ...as those suffering from nutrition-related illnesses need special treatment and care.
- B. ...as weakened adults are unable to work.
- C. ...the quality and enjoyment of life.
- D. ...is life-threatening.
- E. ...an unhealthy state of a person whose physical functions are temporarily or permanently damaged.
- F. ...is not able to grow and develop properly.
- G. ...as children are too weak to attend school and to learn properly.
- H. ...poor diets, illness and disease.



# Malnutrition: true or false?

Test your knowledge  
about malnutrition.

	True	False
1. Malnourished people have a strong defence against disease and rarely fall ill.	<input type="checkbox"/>	<input type="checkbox"/>
2. Malnutrition can lead to death.	<input type="checkbox"/>	<input type="checkbox"/>
3. Malnutrition reduces people's enjoyment of life.	<input type="checkbox"/>	<input type="checkbox"/>
4. Malnourished children have the same chances as well nourished children for good jobs and income in the future.	<input type="checkbox"/>	<input type="checkbox"/>
5. Well nourished people are more active members of their families and communities.	<input type="checkbox"/>	<input type="checkbox"/>
6. The combination of too little food and the presence of disease often results in malnutrition, especially in children.	<input type="checkbox"/>	<input type="checkbox"/>
7. Most malnutrition in the world is caused by emergencies.	<input type="checkbox"/>	<input type="checkbox"/>
8. Malnourished children are active, able to go to school and learn properly.	<input type="checkbox"/>	<input type="checkbox"/>
9. When a country has malnourished people, its economy grows and develops rapidly.	<input type="checkbox"/>	<input type="checkbox"/>



Answer key: 1 False; 2 True; 3 True; 4 False; 5 True; 6 True; 7 False; 8 False; 9 False.

# Vicious cycle of poverty and malnutrition

Fill out this work sheet with your own ideas about how poverty and malnutrition affect each other.



★ Compare your ideas with Work sheet example *Vicious cycle of poverty and malnutrition*

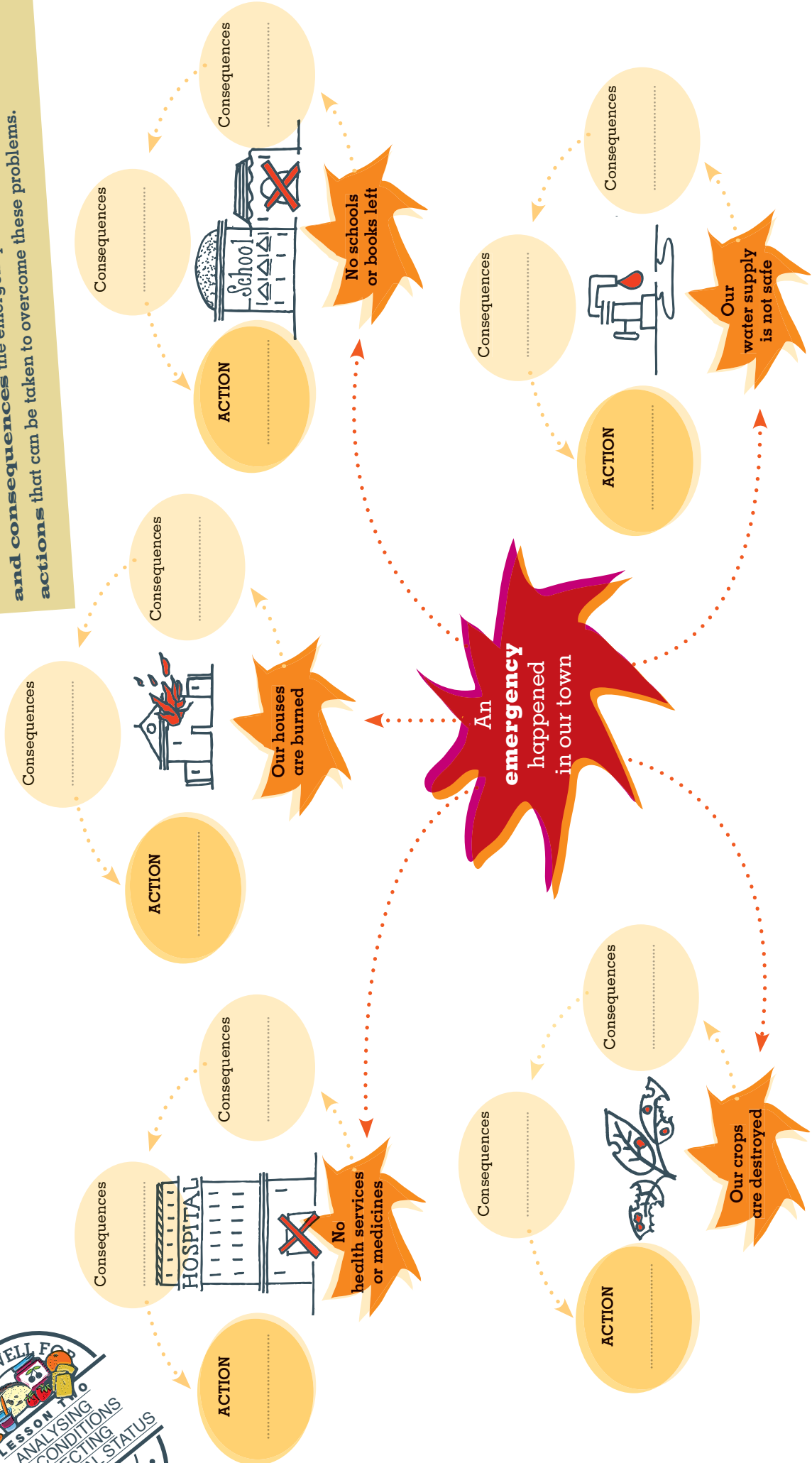
# Vicious cycle of poverty and malnutrition



★ You can compare this with your ideas on your Work sheet **Vicious cycle of poverty and malnutrition**

# An emergency happened in our town

Choose a natural or man-made emergency (earthquake, flood, drought, hurricane, cyclone, tornado, tsunami, war, conflict, epidemic disease, forest fire, plant pests, environmental disaster). On the diagram write the major problems and consequences the emergency causes for families. List actions that can be taken to overcome these problems.



**Topic 1**

What it means  
to be healthy  
and well-nourished

**LEARNING OBJECTIVES**

*By the end of  
the lesson, you  
will be able to:*

- understand that poor diets lead to various forms of malnutrition, which have very serious health consequences for children, adolescents and adults;
- recognize and describe the signs and health effects of poor nutrition.

**Lesson 3**

# Understanding problems of poor nutrition

**LESSON OVERVIEW**

This lesson is about the serious health problems caused by poor nutrition.

It explains how poor diets and infections can lead to different types of malnutrition.

It describes the diseases, illnesses and health problems that can result when people do not get enough food, the right variety of food, or when they eat more food than they need. It discusses the most common problems of poor nutrition and their effects on the body and provides descriptions of their signs and symptoms.

**Part 1**

# Problems of undernutrition



## READING

Poor diets and poor nutrition cause many different and very serious health problems and illnesses. Many of these problems handicap people for their entire lives; some of them lead to death. Diets that do not provide enough food to meet peoples' needs, that do not provide an adequate variety of foods or diets that provide more food than people need, can all lead to malnutrition. Malnutrition exists in some form in almost every country, affecting many millions of children and adults. Very poor diets usually lack both sufficient energy and many essential nutrients. Diets that provide enough or even too much energy can also be deficient in essential nutrients. Poor diets, when combined with poor health and frequent infections that affect the body's ability to digest and absorb enough nutrients to meet nutritional needs can lead to serious health and nutritional problems.

Almost one billion people in the world never get enough food to meet even their minimum energy and nutrient needs. Two hundred million children under five years of age suffer from acute or chronic malnutrition. Every year, an estimated 20 million infants are born with poor growth and development caused by poor nutrition during the mother's pregnancy (in the womb). Malnutrition in early life, including the period of growth in the womb, increases the risk of developing later in life chronic health conditions such as heart disease, diabetes and high blood pressure. Malnutrition is an important factor in the nearly 13 million children under five who die every year from preventable diseases and infections, such as measles, diarrhoea, malaria and pneumonia, or from some combination of these.

People who are undernourished are not able to lead healthy, active and productive lives. They have less energy to carry out normal everyday activities. They are less able to fight infections and become ill more easily and become more seriously ill, unable to recover adequately from an infection or illness. They often need medical care. Undernourished adults are less able to work, earn income and provide and care for themselves and their families. Children who are undernourished will not grow properly and are often too weak or sickly to attend school or to learn properly. For both adults and children, undernutrition commonly leads to much suffering and poor health, to lost human potential, a lower quality of life, stress to the family and the community and to increased expenses for medical care.

### TO THINK ABOUT WHILE READING



What does the word undernutrition mean to you?

How many people in the world are chronically hungry?

What happens when growing children don't get enough food to meet their needs?





The most serious health problems resulting from undernutrition – not eating or being able to digest and absorb enough food to meet the body’s needs – particularly in children, are described below.

### **Stunting**

Childhood stunting – low height-for-age – affects between one-quarter (27%) and two-fifths (40%) of children under five years of age, most of whom are in developing countries. In communities where so many children are short for their age, stunting may not even be noticed, identified and addressed. Stunting results from continual poor nutrition (chronic undernutrition), including low energy and protein intakes, lack of essential vitamins and minerals, especially zinc, and repeated infections. Stunting indicates that the child is not getting enough food to eat or is not able to digest and absorb sufficient nutrients to meet its needs for growth. Continued poor nutritional status during periods of rapid growth, such as infancy and early childhood, are likely to result in permanent stunting.

Stunted children are also likely to be deficient in many nutrients, increasing the chances that they will also have other health problems and will suffer from chronic infections and diseases. Poor nutrition during pregnancy increases the risk of infant and childhood stunting and stunted females are at increased risk of problems with pregnancy and childbirth. Stunted adult women are likely to carry on the cycle of malnutrition by giving birth to low birthweight babies.

### **Wasting**

Wasting – low weight-for-height – affects about 13% of children under the age of five in developing countries, many of whom are severely wasted. These children suffer the combined effects of poor diets and frequent infections and are at extremely high risk of death. Adults who suffer these same conditions are also at risk of wasting. When a child or adult is not able to eat, digest or absorb food sufficiently to meet their energy or nutrient needs, their body breaks down muscles and tissues to carry out essential body processes, resulting in a wasting away of almost all parts of the body. When wasting reaches the severe stage this critical energy is no longer available to support essential body functions, leading to death. Wasting in either children or adults indicates a serious nutritional problem and requires urgent attention to prevent death.

### **Low birthweight babies**

Low birthweight is related to maternal undernutrition. When a pregnant woman is seriously undernourished, her baby is likely to grow and develop poorly in the womb and can be born underweight (2.5kg or less). Babies born underweight who continue to be undernourished are not able to catch up in growth after birth and are likely to suffer illnesses throughout their childhood and adolescence and into adulthood. Low birthweight babies are more likely to die in infancy.

### **Marasmus and Kwashiorkor**

Two conditions reflecting a continued, severe lack of food in children in the first two years of life are marasmus and kwashiorkor. Both conditions result from a



severe lack of energy, protein and some essential vitamins and minerals. A child with marasmus (coming from the Greek word meaning “dying away”) experiences wasting of body fat, muscle and other body parts, and becomes extremely thin, underweight and highly at risk of infections. Eventually, the child is unable to digest and absorb food and to maintain other body processes, and the condition worsens. Kwashiorkor is sometimes referred to as “the illness that affects the first child when the second child is born” because the condition often results when a child is weaned from the breast when another new baby is born. Because complementary or weaning foods given to infants often consist only of cereals, kwashiorkor can occur when calories are sufficient but protein and essential vitamins and minerals in the food are very low. A child with kwashiorkor is underweight and will have frequent infections and illnesses; fluid imbalances will result in a noticeable swelling of the child’s feet and face.



### MATERIALS



Match it work sheet *Undernutrition facts matching*



Fact sheet *Problems of poor nutrition and their signs and effects*



### ACTIVITIES

#### Making the news

##### *Group activity*

Divide into several groups representing TV crews. Each crew is to choose one problem of undernutrition (stunting, wasting, low birthweight babies, marasmus, kwashiorkor) and prepare a 3-minute news report about this problem based on the information from the [Part 1 Reading](#) and any other information sources available. You can create a microphone for the reporter and a large frame to represent the TV screen. Role play the situation and when finished discuss the following questions:

- How common is this problem of undernutrition?
- Who is most affected by this problem?
- How many people are affected?
- How can you tell someone has it?
- Do you often hear on TV or radio the news about undernutrition in the world?
- What do you think and feel when you hear about problems of poor nutrition?



**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 3**  
Understanding  
problems of  
poor nutrition

**Part 1**  
Problems of  
undernutrition

- Why in the 21st century are one billion people chronically hungry?
- What is being done to change the situation?
- What can we do to change this situation?

*If you are working individually*, choose at least one problem of undernutrition (stunting, wasting, low birthweight babies, marasmus, kwashiorkor) to investigate, using the information from the Part 1 Reading and any other information sources available. Prepare a short, 3-minute news-style report about this problem and present it to friends and family.

## Undernutrition facts matching



*If you are working individually*, go to the work sheet Undernutrition facts matching to see if you can correctly match some facts on problems of undernutrition.

*If you are working in a group*, write the undernutrition facts from the work sheet on strips of paper and put them in a hat. Sit in a circle, pass round the hat and select one piece of paper at a time. Read the fact to the rest of the group and try to guess what condition of malnutrition is described.



Look for prompts in the Fact sheet Problems of poor nutrition and their signs and effects. Check your answers on the work sheet.



### KEY POINTS

**Review these four key points** to remember about undernutrition. Check your understanding of the serious health problems that result when people do not have enough food.

## Problems of undernutrition

- People who are undernourished are not able to lead healthy, active and productive lives. They have less energy to carry out normal everyday activities. They are less able to fight infections and become ill more easily and become more seriously ill.
- Malnutrition in early life, including the period of growth in the womb, leads to many serious health problems and illnesses and causes many deaths from preventable diseases and infections.
- Undernourished children are at risk of slow or inadequate physical and mental growth and development and are likely to suffer illnesses throughout their childhood and adolescence and into adulthood.
- Undernourished women are likely to carry on the cycle of malnutrition by giving birth to undernourished, low birthweight babies.



**Part 2**

## Problems from a lack of vitamins and minerals



### READING

Diets that do not provide adequate amounts of essential vitamins and minerals (micronutrients) can lead to severe illness, permanent physical damage or death. People who are not able to meet their needs for calories are at risk of many micronutrient deficiencies. People whose diets are adequate in calories but are not sufficiently varied to cover all their nutrient needs can also suffer from deficiencies of important vitamins and minerals.

The most serious health problems resulting from micronutrient deficiencies – lack of essential vitamins and minerals in the diet – are described below.

**Anaemia, caused primarily by lack of iron in the diet or by poor absorption of iron by the body, is one of the most serious and widespread health problems in the world.** More than 2 billion people are affected by iron deficiency anaemia. Anaemia results in poor growth and development, lower resistance to infections leading to increased disease, and contributes to approximately 20 percent of deaths in pregnancy and childbirth. People with anaemia have less energy, are often tired and are less active. They are often sick, since they have reduced ability to fight infections. Anaemic children may have delayed mental and physical growth and development and less energy. A pregnant woman who has anaemia has a greater chance of giving birth to a low-birthweight infant, who will be less able to fight infection.

Anaemia can also be caused by lack of folate or vitamin B12 and by diseases such as malaria, hookworm infestations and sickle-cell disease. Menstruation and chronic loss of blood caused by ulcers and other internal bleeding can also lead to anaemia. Young children, adolescent girls, pregnant women and women of childbearing age, people who are often sick from malaria, HIV/AIDS, tuberculosis or worm infestations, and those who do not get enough iron from their food, especially already malnourished children, are particularly vulnerable to anaemia.

#### TO THINK ABOUT WHILE READING



What can happen when a person doesn't get enough vitamins and minerals?

Do you know how to prevent the health problems caused by lack of vitamin A, iron, iodine and other essential vitamins and minerals?

★ See [fact sheet on Iron deficiency \(Anaemia\)](#).

Mental retardation and brain damage can be caused by lack of iodine. Lack of sufficient iodine is the most common cause of preventable mental retardation and brain damage in the world. Up to two billion people may



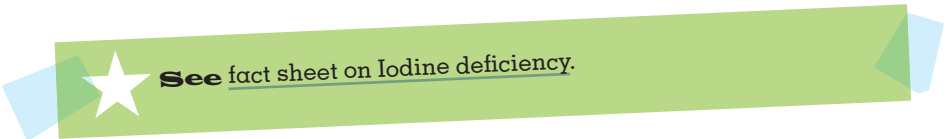
**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 3**  
Understanding  
problems of  
poor nutrition

**Part 2**  
Problems from a  
lack of vitamins  
and minerals

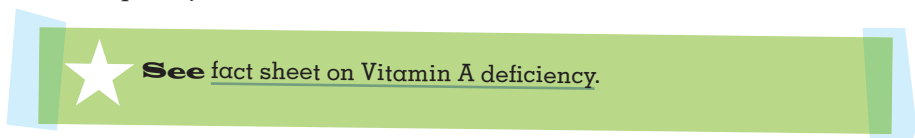
be at risk of iodine deficiency because of lack of sufficient iodine. Millions of people suffer from the effects of permanent mental retardation because of iodine deficiency. In addition, millions of people suffer from goitre – a visible lump in the neck – caused by the swelling of the thyroid gland in response to insufficient iodine in the diet. Adequate iodine is necessary to produce the thyroid hormone, which is essential for normal growth, development and functioning of the brain and body. This hormone is also important for body processes such as converting food to energy, regulating growth and fertility and maintaining body temperature.

Lack of sufficient iodine during pregnancy can cause severe and irreversible physical and mental retardation in the unborn baby. Even a mild deficiency can cause health problems in children, including goitre, low intellectual capacity, growth problems, poor development and fatigue. In adults, lack of iodine can also cause a goitre to form and can lead to reduced mental function, infertility, impotence in men, low energy levels, weight gain and depression.

 **See** [fact sheet on Iodine deficiency](#).

**Permanent blindness and other serious eye problems can be caused by lack of vitamin A.** Vitamin A deficiency, resulting from inadequate quantities of vitamin A in the body, is the leading cause of preventable blindness. Between 200-300 million preschool children in developing countries are at risk of vitamin A deficiency. Every year, many thousands of children lose their sight because of vitamin A deficiency; many of these children die within one year of becoming blind. Lack of vitamin A can lead to serious eye problems, including: poor night vision; dry eyes and damage to the cornea (transparent covering of the eye) and eye nerve damage that can lead to permanent blindness. Lack of vitamin A can also damage the immune system, making it more difficult for the body to fight infections. Because vitamin A is important in bone formation, children with low levels of vitamin A may grow and develop poorly.

When the store of vitamin A in the body is low, and not enough foods that have vitamin A are eaten, a person will become vitamin A deficient. Diseases, illnesses and conditions such as measles, malaria, diarrhoea, malnutrition and low-fat diets also contribute to vitamin A deficiency, as they block the body's ability to absorb vitamin A and cause the body to lose or use up its stores of vitamin A quickly.

 **See** [fact sheet on Vitamin A deficiency](#).

**Beri-beri is caused by a lack of thiamine (vitamin B1).** Thiamine deficiency, in an acute or chronic form, can affect infants, children and adults. Long-term thiamine deficiency that can lead to beri-beri, causes severe weakness



**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 3**  
Understanding  
problems of  
poor nutrition

**Part 2**  
Problems from a  
lack of vitamins  
and minerals

and fatigue, weight loss, progressive weakening and wasting of the muscles, emotional disturbances, pain in the limbs and paralysis, edema (swelling of body tissues) and heart failure. People most at risk of beri-beri are refugees, homeless people, alcoholics, prisoners and people in emergency situations. Thiamine will be insufficient in the breastmilk of women with thiamine deficiency, putting their infants at risk of developing infantile beri-beri, which is severe and often fatal.

**Pellagra, a serious disease that can lead to death if untreated, is caused by lack of niacin (vitamin B3).** Pellagra affects the mucous membranes (moist linings of the mouth and organs) and causes a variety of conditions commonly called “the three Ds”: dermatitis (patchy, flaky skin), diarrhoea and dementia (memory loss, confusion and depression). Niacin deficiency occurs among people whose diets are almost all maize or sorghum, with little variety and low protein. (However, traditional methods of soaking maize in lye help make the niacin in maize more available.) It also occurs among poor populations in remote areas in Asia or Africa, and among refugees, prisoners or others on diets with limited variety. Pellagra results when the diet is extremely deficient in niacin-rich foods (protein-rich foods). Certain other diseases or conditions, such as prolonged diarrhoea or cirrhosis of the liver from alcoholism, can also lead to pellagra.

**Extremely serious birth defects of the spine and brain (called neural tube defects) are caused by lack of folate in early pregnancy.** Folate (a B vitamin also known as folic acid) is important for the development of every cell in the body and is especially important during periods of rapid growth, particularly foetal growth. Women with folate deficiency who become pregnant are more likely to give birth to low birthweight and premature babies and babies with neural tube defects. Folate deficiency can also lead to anaemia. In infants, older children and adults, low folate levels can result in loss of appetite, weight loss, weakness, headaches, behavioural disorders and a form of anaemia, often in association with malaria.

**A disease called scurvy is caused by lack of vitamin C.** Vitamin C deficiency can cause problems with the immune system, resulting in infections and decreased resistance to disease. It causes problems with the formation of connective tissues and cell structure, leading to bleeding in gums and internal organs. It can eventually lead to scurvy, a disease resulting in spongy gums, soft and malformed bones, loose teeth, bleeding from the gums, nose and intestinal tract. Among people deficient in vitamin C, slow healing of wounds, anaemia and infections are common, leading to general weakness and fatigue. In severe deficiency, death from massive internal bleeding and heart failure can result. Extreme vitamin C deficiency is most likely to occur in refugee situations, during food emergencies and among prison populations, but milder forms of the deficiency occur when the diet has little variety of fruits and vegetables.



**Increased risk of disease and poor growth and development can result from a lack of zinc.** Zinc deficiency is considered to be among the leading risk factors for disease in developing countries, particularly among young children. For children under 5, zinc deficiency is estimated to be responsible for 13% of lower respiratory tract infections (mainly pneumonia and influenza), 10% of malaria episodes and 8% of diarrhoea episodes worldwide. Zinc deficiency is mainly caused by inadequate intake or absorption from the diet, and diarrhoea may be a contributing factor. Severe deficiency is rare, but mild to moderate is common throughout the world, with one-third of the world's population estimated to be at risk of zinc deficiency.

Zinc deficiency affects the immune system and can interfere with many organ systems, especially when it occurs during a time of rapid growth and development when nutritional needs are high, such as during infancy, childhood and pregnancy. Lack of zinc also damages the central nervous system and brain, creating developmental problems in children, such as impaired learning and motor functions. Hair loss, skin lesions, wasting of body tissues and poor functioning of eyesight, taste, smell and memory are also connected with zinc deficiency. Deficiency symptoms include severe growth retardation (dwarfism), problems with digestion and absorption causing diarrhoea, increasing the subsequent nutritional problems.

**Poor bone growth, bone conditions and deformities can result from a lack of vitamin D.** Vitamin D helps the body store the calcium it needs for bone growth and other important body functions. A lack of sufficient vitamin D can create a calcium deficiency. Rickets in children and osteoporosis in adults are conditions resulting from insufficient vitamin D. In children, vitamin D deficiency results in poor bone growth and soft, weak bones. It can result in spinal and rib cage deformities, bent legs or crippling, as the bones do not harden properly to support the child when it begins to stand. In extreme cases, the pelvis becomes deformed, which can cause problems in pregnancy for females when they reach their childbearing years. In adults, vitamin D deficiency reduces the density of the bones, causing increased fractures and broken bones. Low levels of vitamin D affect the immune system in both children and adults, decreasing their ability to fight infections. Vitamin D comes from only a few foods, but is made by the body with exposure to sunlight. Vitamin D deficiency occurs in people with limited sun exposure because of cold climates, excessive covering of the skin and use of high-protection sunscreen and among dark-skinned people.



**For more information** on the essential nutrients see [Lesson 4](#) and [Lesson 5](#).

**Topic 1**  
What it means  
to be healthy  
and well-nourished



**Lesson 3**  
Understanding  
problems of  
poor nutrition

**Part 2**  
Problems from a  
lack of vitamins  
and minerals



## MATERIALS



Match it work sheet *Linking deficiencies with health problems*



Quiz work sheet *Lack of micronutrients: true or false?*



Quiz work sheet *Micronutrient deficiency facts*



Fact sheet *Iron deficiency anaemia*



Fact sheet *Iodine deficiency*



Fact sheet *Vitamin A deficiency*



Example work sheet *Good food sources of iron, iodine and vitamin A*



Fact sheet *Problems of poor nutrition and their signs and effects*



## ACTIVITIES

### Yes or No game

#### *Group activity*

Write the following problems from a lack of vitamins and minerals on separate strips of paper; fold them up and put them in a bag, a box or a hat.

*Anaemia / Goitre / Brain damage / Blindness and other eye problems / Beri-beri / Pellagra / Neural tube defect / Scurvy / Rickets / Osteoporosis*

Ask for a volunteer to pick one strip of paper out of the container and read it to himself or herself without letting the rest of the group see it. The group takes turns trying to guess the problem by asking the volunteer Yes or No questions. The volunteer is only allowed to reply Yes or No. If the answer is Yes, a person can ask another question. If the answer is No, it is the next player's turn to ask the question. The questions should be about causes and symptoms of the nutrition problems, and about the people who are most affected by these problems. For example:

- Is your problem caused by a lack of .....? (iodine, iron, vitamin C...)
- Are ..... most affected? (new-born babies, pregnant women, the elderly...)
- Is ..... a symptom of your problem? (paleness, swelling of the thyroid gland, poor vision...)

The first player to guess the problem wins.





## Linking deficiencies with the problems they cause



Go to the Work sheet *Linking deficiencies with health problems* and see if you can link the vitamins and minerals with the health problems they can cause if people do not get enough of them from their food.

## Lack of micronutrients: True or False?



Take a quick quiz to check your understanding of some basic facts about the health problems that can result from a lack of essential vitamins and minerals.

## Micronutrient deficiency facts



Take this multiple-choice quiz to see what you have learned about problems of micronutrient deficiencies.

## Exam role-play



Review the three fact sheets on *iron deficiency*, *iodine deficiency* and *vitamin A deficiency*. Split into two groups and pretend that one group are students taking their exam and another group is a board of professors, interrogating the students about these deficiencies. Role play the exam situation. For example, some of the questions on iodine deficiency may include:

*What is iodine deficiency?*

*Who is at risk of iodine deficiency?*

*What causes iodine deficiency?*

*What are the effects of iodine deficiency in children? In pregnant women? In adults?*

*What are the signs of iodine deficiency?*

*How can it be prevented?*

*How can it be treated?*

*Can iodine be stored in the body for a long time?*

*What foods are good sources of iodine?*

## Iron, iodine or vitamin A?



Review the fact sheets on *iron*, *iodine* and *vitamin A* and find the information about good food sources of each one. Prepare a selection of foods containing these three micronutrients, using real foods, drawings, photos of foods or flash cards. Make sure the number of foods in each group is equal: for example, choose 10 iron food sources, 10 iodine foods and 10 foods containing vitamin A. Arrange the foods on a tray or a large sheet of paper and cover with a cloth or another large sheet of paper so that the group does not see it before beginning the game.

Divide the group into three teams: the first team is to identify and remember all the food sources of iron; the second team should do the same with iodine; and the third team should identify foods rich in vitamin A.



**Topic 1**  
What it means  
to be healthy  
and well-nourished

**Lesson 3**  
Understanding  
problems of  
poor nutrition

**Part 2**  
Problems from a  
lack of vitamins  
and minerals

Uncover the tray and show the foods to the group. Hold the foods up one by one, name them and put them back on the tray. Cover the tray and give each group a pen and a paper. Allow 5 minutes for:

- Team 1 to write the names of as many foods containing iron as they can remember
- Team 2 to write the names of as many foods containing iodine as they can remember
- Team 3 to write the names of as many foods containing vitamin A as they can remember



Check the lists all together and score one point for each correct food.

## Campaign against anaemia and other deficiencies

Research and investigate how common deficiencies of iron, iodine and vitamin A are in your community. Information can be gathered from health care workers, clinics and hospitals to learn how many people and which groups of people in particular in the community suffer from health problems caused by these deficiencies.

Organize a communication campaign in your community to raise people's awareness of the health problems caused by micronutrient deficiencies. Create attractive, colourful and informative leaflets, posters, brochures or information booklets about these serious problems, using the information in the three fact sheets on anaemia, iodine deficiency and vitamin A deficiency and any information you have gathered from experts in the community. This can be done for all three of these deficiencies or for the deficiency that is most common in your community. When ready, present your communication products to the rest of the group, copy or photocopy them and display in public places or distribute to the people in your community.



### KEY POINTS

**Review these three key points** to remember about the serious health problems that can happen if people lack essential vitamins and minerals in their diets. See if you can recognize the signs of these deficiencies.

### Problems from a lack of vitamins and minerals (micronutrient deficiencies)

- Diets that do not provide adequate amounts of essential vitamins and minerals (micronutrients) can lead to severe illness, permanent physical damage or death.
- People whose diets are adequate in energy (calories) but are not sufficiently varied to cover all their nutrient needs can also suffer problems of deficiencies of important vitamins and minerals.
- Many of the most severe health problems caused by the three leading micronutrient deficiencies, such as mental retardation and cretinism (iodine), physical growth retardation and impaired reproductive functions (iron), and childhood blindness (vitamin A), could be greatly reduced by a good and varied diet that provides these essential micronutrients.

## Part 3

# Problems of “overnutrition”



### READING

#### TO THINK ABOUT WHILE READING



What can lead  
to overweight  
and obesity?

What health  
problems are  
associated with  
excessive  
body weight  
and fat?

Diets that provide more food energy (calories) than people need lead to overweight and obesity. Being overweight or obese can result in many physical disabilities and life-threatening health problems. Rates of overweight and obesity have increased around the world in all countries, as many people have decreased their activity levels and adopted less healthful eating habits. Many developing countries are experiencing major problems of both undernutrition and obesity, and their resulting health problems. Over 1 billion adults are overweight and 300 million are obese, and rates among children are rising rapidly. Obesity at an early age is a risk of increased likelihood of obesity in adulthood, certain serious diseases and shortened lives.

Obesity is an extreme form of overweight resulting from an accumulation of excessive amounts of body fat. Obesity is caused by an imbalance between the amount of energy in the diet and the amount of energy used through activity and body processes. Obesity increases the risk of chronic diseases including type 2 diabetes, hypertension (high blood pressure), stroke, heart disease, cancer, joint problems, gall bladder problems, decreased mobility and difficulty in breathing. The health consequences of these conditions range from premature death to disabilities that reduce quality of life. In addition, in cultures where obesity is not considered attractive, obese and overweight people often have lowered self-esteem and mental health problems and risk poor health through unhealthy eating patterns and dieting in order to lose weight.



### MATERIALS



Work sheet *Problems related to obesity*



Quiz work sheet *Overweight and obesity: true or false?*



Fact sheet *Problems of poor nutrition and their signs and effects*

**Topic 1**  
What it means  
to be healthy  
and well-nourished



**Lesson 3**  
Understanding  
problems of  
poor nutrition

**Part 3**  
Problems of  
"overnutrition"



## ACTIVITIES

### What problems are related to obesity?



Go to the Work sheet *Problems related to obesity* and underline those health risks and problems associated with excessive body fat. Use the Fact sheet *Problems of poor nutrition and their signs and effects* for information on obesity.

### Overweight and obesity: true or false?



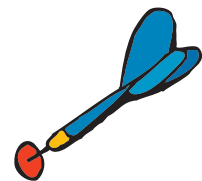
Take a quick quiz to check your knowledge of some basic facts about overweight and obesity.

## KEY POINTS

**Review these two key points** to remember about the problems of "overnutrition" - eating more food than is needed. See if your understanding of what causes overweight and obesity, and the diseases and health problems associated with them, has improved.

### Problems of "overnutrition" – overweight and obesity

- Eating more food than the body needs causes an excess accumulation of fat in the body, which leads to people becoming too fat. Overweight and obesity are caused by an imbalance between the amount of energy a person gets from food and the amount of energy the person uses for activity and body processes.
- People who are overweight or obese are at risk of many serious and life-threatening chronic diseases and disabilities, such as diabetes, high blood pressure, stroke, heart disease, some cancers, joint problems, gall bladder problems, decreased mobility and difficulty in breathing.



# Undernutrition facts matching

Match the problems of undernutrition to their description (facts).

## Problems

- A. Stunting
- B. Wasting
- C. Low birth weight
- D. Marasmus
- E. Kwashiorkor
- F. Malnutrition

## Undernutrition facts

1. It exists in some form in almost every country, affecting many millions of children and adults.
2. A child with this condition often has pot belly, swollen feet and face, reddish hair and loss of hair.
3. A baby whose mother was seriously undernourished during pregnancy is at risk of this at birth.
4. This nutrition problem affects nearly one out of every three children under five years of age in developing countries.
5. When food is severely lacking the body uses muscles and tissues to support its processes, which results in this serious health condition.
6. These forms of severe malnutrition affect children under two years of age whose diets acutely lack protein, energy and some essential vitamins and minerals.
7. Girls who suffer from this condition are at increased risk of problems in pregnancy and childbirth when they grow up.
8. In communities where many children are short for their age, this condition can pass unnoticed and unaddressed.
9. The name of this disease comes from the Greek word meaning "dying away".
10. This is an important factor in the 13 million children under five who die every year from preventable diseases and infections.



Answer key: 1F; 2E; 3C; 4A; 5B; 6D; 7A; 8A; 9D; 10F.

You can look for more information in:  
Fact sheet: Problems of poor nutrition and their signs and effects

# Problems of poor nutrition and their signs and effects

## Problem

## Signs and effects on the human body

### Undernutrition

Inadequate total food energy and nutrients

Loss of body weight; at risk to be deficient in multiple nutrients, with resulting health problems and illnesses. Over time, can lead to growth retardation, impaired motor skills, learning capacity and mental functioning, less resistance and high susceptibility to infections. In pregnant women, can result in low birthweight babies.

### Stunting

Chronic undernutrition

Low height-for-age; at risk of deficiencies in multiple nutrients, with resulting health problems and illnesses. Failure to grow and develop to normal height; high susceptibility to chronic infections and diseases. In females, can cause reproductive problems and in pregnancy increases risk of infant and childhood stunting.

### Wasting

Acute undernutrition

Low weight-for-height. Failure to grow and thrive, less resistance and high susceptibility to infections. Wasting of body fat and if continued over time, also wasting of muscle and other parts of the body. High risk of serious disease or death, if severe.

### Marasmus

Chronic, severe undernutrition

Occurs mainly in the first 2 years of life. Extremely low body weight, wasting of body fat, muscle and other body parts. Inability to maintain body processes. Less resistance and high susceptibility to infections. Bulging abdomen.

### Kwashiorkor

Acute, sudden lack of protein, energy and some micronutrients

Occurs mainly from 4–6 months to 2 years of age. Fluid imbalance and water retention, especially in the feet, skin ulcers (sores); fatty liver. Pot belly, swelling of the feet, body and face; loss of hair, reddish hair, peeling of skin and loss of skin pigmentation, anaemia. Irritability, loss of appetite and failure to grow and thrive; high susceptibility to infections and frequent illness.

### Overweight and obesity

More food energy is consumed than expended

Excess body fat. Limited ability for normal movement and difficulties with physical activity. Increased risk of high cholesterol and high blood pressure; diabetes and heart problems.

*Continued*



★ Reading this fact sheet will help you complete Work sheet **Undernutrition facts matching** and Work sheet **Linking deficiencies with health problems**

<b>Problem</b>	<b>Signs and effects on the human body</b>
<b>Parasites</b> especially worm infestations	Fatigue and weakness; poor growth; diarrhoea and dehydration; reduced utilization of nutrients in foods; nutrient deficiencies.
<b>Anorexia</b> Deliberately eating too little	Deliberate low food intake, leading to significant weight loss and low weight for age and height. Low self-esteem and body image, feelings of inadequacy, anxiety, social dysfunction, depression, moodiness. Can cause delay in puberty, absent menstrual periods, hair loss, sleeping problems, low blood pressure, slow heartbeat, heart damage and infertility.
<b>Bulimia</b> Deliberate and excessive overeating and then purging	Compulsion to binge eat and then purge the body by self-induced vomiting or use of laxatives, leading to significant weight loss. Low self-esteem and body image, feelings of inadequacy, anxiety, social dysfunction, depression, moodiness. Can cause irregular heartbeat, chronic irregular bowel movements, inflammation of the esophagus, tooth decay, ulcers and pancreatitis.
<b>Anaemia</b> Iron deficiency	Learning difficulties; reduced resistance to infections; impairment of intellectual performance. General tiredness or weakness; headache, breathlessness and faster heartbeat following even normal physical activities. Paleness of inner eyelids, tongue, lips, skin and beneath the nails, swollen hands and legs, loss of appetite, dizziness, especially in pregnant women.
<b>Vitamin A deficiency</b>	Poor vision in dim light (night blindness), permanent total blindness, reduced resistance to infection, dryness of the inner eyelids, foamy spots on the eyes (Bitot spots), dryness, dullness or clouding of the cornea (transparent outer covering of the eye).
<b>Iodine deficiency</b>	Frequent illness; learning disabilities and problems in speaking (deaf-mutism); goitre (enlargement of the thyroid gland); grossly impaired mental development; impaired reproductive performance. Can result in permanent mental retardation.
<b>Niacin deficiency (B<sub>3</sub>)</b>	Can result in Pellagra, a serious disease affecting the skin, gastro-intestinal tract and the nervous system. Red and itchy skin; nausea, vomiting, constipation, weakness, anxiety, depression. In severe cases, diarrhoea, delirium and dementia.

Continued



**Problem****Signs and effects on the human body****Thiamin deficiency (B<sub>1</sub>)**

Heart problems, muscle weakness, memory loss, poor food intake, weight loss. Prolonged deficiency results in Beri-beri, whose signs include: loss of appetite, weight loss, tiredness and weakness, heaviness and swelling of the legs; restlessness; breathlessness; increased pulse rate; heart failure, progressive weakness and wasting of the muscles, emotional disturbances.

**Vitamin C deficiency**

Problems with the immune system, resulting in frequent infections, increased susceptibility to disease and anaemia. Extreme deficiency can lead to scurvy, a disease affecting the gums, bones, teeth and intestinal tract, and to death from massive internal bleeding and heart failure. Signs include: painful joints and limbs; swollen and bleeding gums; slow healing or re-opening of wounds; brittle hair, pinpoint haemorrhages (small spots on the skin).

**Vitamin D deficiency**

Decreased ability to fight infections. In children, results in poor bone growth and spinal and rib cage deformities (rickets). In adults (osteoporosis), reduces bone density, leading to increased fractures and broken bones. Early signs: sleeplessness; nervousness; restlessness; loss of appetite. More developed signs: excessive sweating; swollen wrists and ankles; swelling of the ribs; protuberant abdomen; bowing of the legs.

**Folate deficiency**

In pregnancy, results in extremely serious birth defects of the spine and brain in the infant and low birthweight babies. In adults can result in a form of anaemia. In infants and young children can slow growth. Loss of appetite, weight loss, weakness and tiredness. Paleness of inner eyelids and beneath nails; tiredness, headaches, breathlessness, neurological disturbances.

**Zinc deficiency**

Interferes with many organ systems, especially during infancy, childhood and pregnancy. Growth retardation; damage to central nervous system and brain. Impaired learning and motor functions, hair loss, skin lesions, wasting, poor eyesight, poor digestion.





# Linking deficiencies with health problems

Do you know enough?  
Try to match vitamin and mineral deficiencies in the left column with the health problems they can cause if people do not get enough of them from their food.

## Deficiency

1. Lack of iron
2. Lack of iodine
3. Lack of folate
4. Lack of zinc
5. Lack of vitamin A
6. Lack of thiamine (B<sub>1</sub>)
7. Lack of niacin (B<sub>3</sub>)
8. Lack of vitamin C
9. Lack of vitamin D

## Health problem or disease

- Pellagra
- Scurvy
- Anaemia
- Rickets and osteoporosis
- Serious eye problems and blindness
- Beri-Beri
- Severe growth retardation (dwarfism)
- Mental retardation, brain damage and goitre
- Neural tube defects (serious birth defects)



**You can look for more information on**  
Fact sheet **Problems of poor nutrition and their signs and effects**

**Answer key:** 1 Anaemia; 2 Mental retardation, brain damage and goitre; 3 Neural tube defects; 4 Severe growth retardation (dwarfism); 5 Serious eye problems and blindness; 6 Beri-Beri; 7 Pellagra; 8 Scurvy; 9 Rickets and osteoporosis.

# Lack of micronutrients: true or false?

How much do you know about the micronutrients? See if you can answer correctly each of these statements.

	True	False
1. Vitamin D deficiency occurs in people with little sun exposure.	<input type="checkbox"/>	<input type="checkbox"/>
2. Folate is especially important in older age.	<input type="checkbox"/>	<input type="checkbox"/>
3. Anaemia is caused by lack of iodine.	<input type="checkbox"/>	<input type="checkbox"/>
4. Vitamin D deficiency can lead to rickets in children and osteoporosis in adults.	<input type="checkbox"/>	<input type="checkbox"/>
5. Pellagra occurs among people whose diets are almost wholly based on vegetables and fruits.	<input type="checkbox"/>	<input type="checkbox"/>
6. Iodine cannot be stored for long in the body, so small amounts of it must be eaten regularly.	<input type="checkbox"/>	<input type="checkbox"/>
7. Lack of iron can cause mental retardation, brain damage and goiter.	<input type="checkbox"/>	<input type="checkbox"/>
8. Women with folate deficiency are more likely to give birth to babies with serious defects of the spine and brain.	<input type="checkbox"/>	<input type="checkbox"/>
9. Lack of vitamin A can lead to permanent blindness.	<input type="checkbox"/>	<input type="checkbox"/>
10. People most at risk of thiamine and niacin deficiencies are refugees, prisoners and alcoholics.	<input type="checkbox"/>	<input type="checkbox"/>
11. Mental retardation and brain damage caused by lack of iodine are preventable but not curable.	<input type="checkbox"/>	<input type="checkbox"/>
12. Anaemic people are active and full of energy.	<input type="checkbox"/>	<input type="checkbox"/>
13. Beri-beri and pellagra can lead to death if untreated.	<input type="checkbox"/>	<input type="checkbox"/>
14. Zinc deficiency is among the leading risk factors for disease in developing countries.	<input type="checkbox"/>	<input type="checkbox"/>



**You can look for more information on**  
*Fact sheet Problems of poor nutrition and their signs and effects*

**Answer key:** 1 True; 2 False; 3 False; 4 True; 5 False; 6 True; 7 False; 8 True; 9 True; 10 True; 11 True; 12 False; 13 True; 14 True

# Micronutrient deficiency facts

How much have you learned about the problems of micronutrient deficiencies? Take this quick multiple choice exercise and test your knowledge.

1. **Lack of what micronutrient causes anaemia?**
  - A. Iodine
  - B. Iron
  - C. Zinc
  - D. Vitamin A

---

2. **What percentage of deaths in pregnancy and childbirth does anaemia contribute to?**
  - A. About 1%
  - B. About 10%
  - C. About 15%
  - D. About 20%

---

3. **How many people worldwide are affected by or at risk of iron deficiency?**
  - A. Over 2.5 million
  - B. Over 20 million
  - C. Over 200 million
  - D. Over 2 billion

---

4. **Who is particularly vulnerable to anaemia?**
  - A. Small children
  - B. Adolescent girls and women of childbearing age
  - C. People with malaria, HIV/AIDS, worm infestations, tuberculosis
  - D. People who do not eat enough iron-rich foods
  - E. All of the above

---

5. **How many people lack sufficient iodine and risk iodine deficiency?**
  - A. 200 thousand people
  - B. 2 million people
  - C. 200 million people
  - D. 2 billion people

---

6. **What is goitre?**
  - A. An eye nerve damage that leads to blindness
  - B. A neural tube defect
  - C. A visible lump in the neck caused by the thyroid gland swelling in response to lack of iodine
  - D. Internal bleeding which can lead to anaemia

Continued



You can look for more information on **Problems of poor nutrition and their signs and effects** Fact sheet

**7. What health problems can be caused by the lack of vitamin A?**

- A. Memory loss
- B. Serious eye problems and total blindness
- C. Weight gain
- D. Diarrhoea

**8. How can vitamin A deficiency be prevented?**

- A. Through a healthy, well-balanced diet containing foods rich in vitamin A.
- B. By consuming foods fortified with vitamin A.
- C. Through supplements when vitamin A-rich foods are not available.
- D. By early treatment of pneumonia, diarrhoea, measles, malnutrition and malaria.
- E. By all of the above

**9. What is a common name for conditions caused by pellagra?**

- A. "The three Ms": measles, malaria, mental retardation
- B. "The three Es": edema, emotional disturbances, eye infections
- C. "The three Ds": dermatitis, diarrhoea, dementia
- D. "The three Hs": hair loss, headache, hookworm

**10. What are the signs of scurvy?**

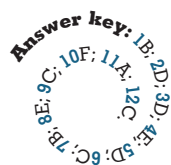
- A. Bleeding from the gums and internal organs
- B. Loose teeth
- C. Soft and deformed bones
- D. Slow healing of wounds
- E. Brittle hair
- F. All of the above

**11. How many people in the world are at risk of zinc deficiency?**

- A. One-third of the population
- B. One-half of the population
- C. One-quarter of the population
- D. One-fifth of the population

**12. What health problems can be caused by the lack of vitamin D?**

- A. Poor eyesight
- B. Cirrhosis of the liver
- C. Poor bone growth and soft, weak bones
- D. Poor digestion



# Iron deficiency anaemia

**Anaemia** is a serious health and nutritional problem caused by lack of iron in the diet or poor absorption of iron. Anaemia can also be caused by lack of folate or vitamin B<sub>12</sub> and by diseases such as malaria, hookworm infestations and sickle-cell disease. Menstruation and chronic loss of blood caused by ulcers and other internal bleeding can also lead to anaemia. Iron deficiency anaemia can result in poor growth and development, low resistance to disease, poor reproductive functions, increased illness and contributes to deaths in pregnancy and childbirth.

## What is anaemia?

- Anaemia, also referred to as “weak”, “thin” or “pale” blood, is a condition resulting from a low level of haemoglobin (substance that makes blood red) in the blood. Sufficient levels of haemoglobin are needed in the blood to carry oxygen through the body, allowing the body to move and function properly.

## Who is at risk of anaemia?

- Pregnant women
- Women of childbearing age
- Adolescent girls
- Children below 12 years
- A person who is frequently sick, especially from malaria, HIV/AIDS, TB, worm infestations
- People who do not eat enough iron-rich foods
- Malnourished children

## What causes anaemia?

- Lack of iron is the most common cause of anaemia. Other nutritional causes of anaemia are lack of folate, vitamin B<sub>12</sub> and vitamin A.
- Malaria, which damages the red part of the blood where iron is stored, is a cause of anaemia.
- Hook worm infestations, which suck blood from the intestine.
- Increased loss of blood (heavy bleeding) causes anaemia.
- Other infections, such as HIV/AIDS and sickle-cell disease.

*Continued*



**What are the effects of anaemia?**

- People suffering from anaemia feel tired and lack energy; this tiredness is often more intense than the tiredness caused by a simple lack of sleep. The results of anaemia include frequent tiredness or weakness, headaches, pale skin colour, poor resistance to cold temperatures and a tendency to be less active.
- Anaemia reduces resistance to disease and ability to fight infections, which can lead to more frequent illness.
- Anaemia can impair reproductive functions.
- Anaemic children:
  - may have delayed physical and mental growth and development
  - have less energy to play, learn and develop.
- Pregnant women with anaemia:
  - have an increased risk of dying during and after pregnancy
  - have an increased risk of giving birth to a low birthweight infant who has low ability to fight infection.
- Anaemia reduces people's capacity to engage in physical work, as well as mental productivity, often reducing families' productive economic activities.

**How can you tell someone has anaemia?**

A person who has anaemia may have some or all of the following signs:

- general feeling of tiredness or weakness
- headache
- breathlessness (short breath) and a faster heartbeat
- pale or whitish tongue and inside of the lips
- pale inside the lower eyelid
- swollen legs and hands
- loss of appetite
- desire to eat peculiar substances such as dirt or ice
- dizziness, especially in pregnant women.

**How can we prevent anaemia?**

- Eating iron-rich foods and vitamin C-rich foods every day.
- Adding iron-rich foods (well-cooked and mashed) to babies' diets after they are 6 months old, in addition to breastmilk.
- In pregnancy, when the need for iron is especially high, taking iron and folic acid tablets regularly and increasing the amount of iron-rich foods in the diet.
- Spacing pregnancies helps give a woman's body enough time to build up good iron stores, thus protecting the woman from anaemia.
- Protection against hookworm infections, malaria and other causes of anaemia.
- Early detection and treatment of any infection in a person.
- Protecting against malaria by sleeping under a treated mosquito net.



Continued

**How can we treat anaemia?**

- Treatment of anaemia depends on the age and overall health of the person and on the cause and degree of anaemia. Anaemia is best treated through improving the diet by eating more iron-rich foods (see list of Good food sources below).
- In certain cases, additional iron supplements are required to treat anaemia.
- During pregnancy and breastfeeding, in addition to eating more iron-rich foods, iron tablets, folic acid and other micronutrient supplements are needed to treat and prevent anaemia; a doctor or other health care provider should be consulted.
- Proper diagnosis, treatment and management of hookworm, malaria and other parasitic diseases that cause anaemia are often needed to treat anaemia.

**Good food sources of iron**

- Animal foods
  - beef
  - pork
  - lamb
  - liver and other organs
  - poultry: chicken, duck, turkey (especially the dark meat)
  - eggs (medium source)
- Seafoods
  - fish
  - shellfish: clams, mussels, oysters
- Plant foods
  - dark leafy greens: broccoli, spinach, kale, turnip greens, collards
  - legumes: beans, peas, lentils
  - dried fruits
- Some fruits increase the body's ability to absorb iron in foods. These are fruits such as oranges, lemons, guava, mangos and some wild fruits that contain vitamin C. Eating these fruits together with iron-rich plant foods or adding their juices to vegetables improves iron absorption.
- Tea (with caffeine) may impair iron absorption and should not be taken during meal times.



Reading this fact sheet will help you to complete  
 Work sheet **Linking deficiencies with health problems**,  
 Work sheet **Lack of micronutrients: true or false?**  
 and Work sheet **Micronutrient deficiency facts**

# Iodine deficiency

**Iodine** is needed for the proper functioning of the thyroid gland, which helps control the way the body works. Iodine is essential for the normal growth, development and functioning of the brain and body. Lack of sufficient iodine is the most common cause of preventable mental retardation and brain damage in the world.

## What is iodine deficiency?

- Iodine deficiency is a condition that results from low or insufficient amounts of iodine in the body. Adequate iodine intake is necessary for the production of the thyroid hormone, which is essential for the normal growth, development and functioning of the brain and body. It is also important for body processes such as converting food to energy, regulating growth and fertility and maintaining body temperature.
- When the body becomes iodine deficient, both physical and mental development are damaged. Even a mild deficiency can cause health problems, including an increased risk of stillbirths (babies born dead), infant deaths and low intellectual capacity. Severe iodine-deficiency results in irreversible mental retardation, deafness and a loss of muscle control and physical movement.
- Iodine cannot be stored for long in the body, so small amounts of iodine must be consumed regularly.

## Who is at risk of developing iodine deficiency?

- People of any age who live in mountainous and remote inland areas, or in other areas where food is grown in soil that does not contain sufficient iodine and where there are no adequate iodine fortification programmes
- Pregnant and breastfeeding women
- Infants and children

## What causes iodine deficiency?

- Iodine deficiency is caused by a diet that does not contain enough foods rich in iodine to meet the body's needs.

*Continued*





**What are the effects of iodine deficiency?**

- In children, lack of iodine can lead to:
  - mental retardation
  - loss of muscle control and physical movement
  - failure to grow properly
  - frequent infections and illness
  - learning difficulties
  - hearing and speaking problems (deaf-mutism)
- In pregnant women, lack of iodine can lead to:
  - miscarriage (losing the baby before it is developed and ready to be born)
  - stillbirths (babies born dead)
  - infant deaths
  - poor development of the baby
  - babies born with irreversible mental retardation, growth failure, speech and hearing defects
- In adults, lack of iodine can lead to:
  - reduced mental function
  - infertility
  - impotence in men
  - heart failure
  - goitre, or hypothyroidism, a condition that can result in low energy levels, loss of sensation in the legs and other body extremities and other health problems

**How can you tell someone has iodine deficiency?**

Some of the mild signs of iodine deficiency may not be noticed or may resemble other illnesses or health conditions. A person who has iodine deficiency may have some or all of the following signs:

- low energy levels, tiredness, fatigue
- dry or scaly or yellowish skin
- dry, coarse hair
- tingling and numbness in extremities
- muscle cramps
- swelling of the legs
- weight gain
- forgetfulness
- personality changes or depression
- anaemia, and prolonged and heavy periods in women
- goitre (a swelling of the thyroid gland) is visible in the neck between the Adam's apple and the collar bone.

*Continued*



**How can iodine deficiency be prevented?**

- Iodine deficiency can be prevented by eating a balanced diet that contains foods rich in iodine (see Good food sources below).
- In areas where the soil is poor in iodine and iodine-rich foods are not available, consuming foods fortified with iodine (usually salt) or taking iodized oil supplements will help prevent iodine deficiency.
- Women who are pregnant, or thinking about becoming pregnant, or breastfeeding may benefit from taking iodine supplements if iodine-rich foods or iodized salt are not available; a doctor or other health care provider should be consulted.

**How can iodine deficiency be treated?**

- Effective treatment of iodine deficiency depends on early identification and treatment under the care of a doctor. Mental retardation and brain damage caused by iodine deficiency is preventable but not curable.

**Good food sources of iodine**

- The iodine content of most foods depends on the iodine content of the soil in which plant foods grow or on which animals graze.
- Seafood is rich in iodine:
  - saltwater fish
  - seaweed/sea vegetables, such as kelp, dulse, wakame
  - white deep-water fish
  - sea salt
  - cod liver oil
- Plant sources:
  - lima beans
  - soybeans
  - spinach
  - turnip greens
  - some squashes
  - sesame seeds
  - asparagus
  - mushrooms
  - garlic
- Fortified sources
  - iodized salt



★ Reading this fact sheet will help you to complete  
 Work sheet **Linking deficiencies with health problems,**  
 Work sheet **Lack of micronutrients: true or false?**  
 and Work sheet **Micronutrient deficiency facts**

# Vitamin A deficiency

Vitamin A is needed for building and maintaining healthy tissues throughout the body, particularly the eyes, skin, bones and tissues of the respiratory and digestive tracts, and for the immune system, which helps prevent or fight off infections. Most of the health consequences of vitamin A deficiency can be prevented through a healthy, well-balanced diet rich in vitamin A.

## What is vitamin A deficiency?

- Vitamin A deficiency is a condition that results from inadequate quantities of vitamin A in the body. Lack of vitamin A (vitamin A deficiency) can damage the immune system, making people more likely to suffer from infections. Severe vitamin A deficiency can lead to eye problems, poor vision and irreversible blindness. Vitamin A deficiency is the major cause of blindness in children.
- The body can store vitamin A so that there is a reserve when we need it. When the store of vitamin A in the body is low, and not enough foods that have vitamin A are eaten, a person will become vitamin A deficient.

## Who is at risk of developing vitamin A deficiency?

- Newborn babies who are not given colostrum (first breastmilk)
- Infants who are not breastfed
- Infants born or breastfed from mothers with vitamin A deficiency
- Infants born with very low weight (under 2.5 Kilos)
- Children between 6 months and 6 years of age
- Children who are malnourished and suffer from measles, diarrhoea and other infections
- School-age children, pregnant adolescent girls and elderly people
- People of any age who are malnourished and do not have a diet rich in vitamin A

## What causes vitamin A deficiency?

- Vitamin A deficiency is caused by a poor diet that does not contain enough foods rich in vitamin A to meet the body's needs.
  - Oil or fat in the diet is needed to help the body absorb vitamin A from foods.
- It is also caused by measles, diarrhoea and other infections and repeated illnesses that block absorption and cause the body to lose or use up stores of vitamin A more quickly.

Continued



**What are the effects of vitamin A deficiency?**

- Eye problems, poor vision and in severe cases, permanent blindness.
- Diseases of the respiratory and digestive systems.
- Repeated illnesses, because the body's defence mechanism is low, and general poor health.
- Poor growth and development in children.

**How can you tell someone has vitamin A deficiency?**

- A person who suffers from vitamin A deficiency may have some or all of the following signs:
  - poor vision, especially in poor or dim light
  - dryness of the lining of the eye
  - whitish soapy patches on the outer white part of the eye
  - lesions or damage to the cornea (the transparent outer covering) of the eye

**How can vitamin A deficiency be prevented?**

- Vitamin A deficiency can be prevented through a healthy, well-balanced diet containing foods rich in vitamin A and fat, which is needed for the body to absorb vitamin A.
- Consuming foods to which vitamin A has been added (fortified).
- Supplements of vitamin A (in the form of pills or tablets) when vitamin A-rich foods are not available.
- Early detection and treatment of conditions such as pneumonia, diarrhoea, measles, malnutrition and malaria.

**How can vitamin A deficiency be treated?**

- Effective treatment of vitamin A deficiency depends on early identification of the problem. Blindness caused by severe vitamin A deficiency is preventable but not curable.
- Treatment of severe vitamin A deficiency:
  - A child with any signs of eye problems, such as night blindness (chicken eyes) or dry eyes, needs urgent medical attention and vitamin A supplements.
- People suffering from vitamin A deficiency need to eat foods rich in vitamin A and foods fortified with vitamin A. (see Good food sources below)
- Proper treatment of diarrhoea, malnutrition, measles, malaria and tuberculosis.

*Continued*

**Good food sources of vitamin A**

- Plant foods rich in vitamin A:
  - dark green leafy vegetables such as cassava leaves, pumpkin leaves, bean leaves, sweet potato leaves, amaranthus, spinach, broccoli, kale
  - orange and yellow vegetables such as pumpkins and carrots
  - orange coloured fruits like mangoes, papaya and pawpaw (citrus fruits like oranges, lemons, mandarins do not contain vitamin A)
  - yellow/orange sweet potatoes, yellow maize and yellow/red sweet peppers
  - red palm oil
- Animal foods rich in vitamin A:
  - liver
  - kidneys
  - small fish eaten whole
  - fish oils
  - egg yolks
  - breastmilk (especially colostrum)
  - fortified milk, butter and cheese
- Some foods, usually sugar, are fortified with vitamin A (have added vitamin A).
- Foods can be enriched with vitamin A in the home by adding palm oil to leafy green vegetables and to foods such as porridge, rice, all kinds of relishes, cassava and sweet potatoes.



Reading this fact sheet will help you to complete  
 Work sheet **Linking deficiencies with health problems**,  
 Work sheet **Lack of micronutrients: true or false?**  
 and Work sheet **Micronutrient deficiency facts**



# Good food sources of iron, iodine and vitamin A

*(Team 1)*

**Iron:**

- Beef
- Pork
- Lamb
- Liver and other organs
- Poultry: chicken, duck, turkey
- Eggs
- Fish
- Clams
- Mussels
- Oysters
- Dark leafy greens
- Broccoli
- Spinach
- Kale
- Turnip greens
- Collards
- Beans
- Peas
- Lentils
- Dried fruits

*(Team 2)*

**Iodine:**

- Saltwater fish
- Seaweed such as kelp, dulse, wakame
- White deep-water fish
- Sea salt
- Iodized salt
- Cod liver oil
- Lima beans
- Soybeans
- Spinach
- Turnip greens
- Some squashes
- Sesame seeds
- Asparagus
- Mushrooms
- Garlic

*(Team 3)*

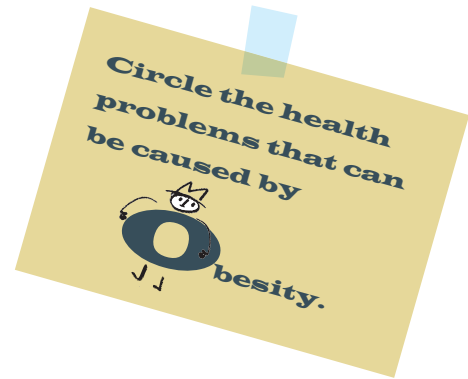
**Vitamin A:**

- Dark green leafy vegetables
- Cassava leaves
- Pumpkin leaves
- Bean leaves
- Sweet potato leaves
- Amaranthus
- Spinach
- Broccoli
- Kale
- Pumpkins
- Carrots
- Mangoes
- Papaya/pawpaw
- Sweet potatoes
- Maize
- Yellow/red sweet peppers
- Red palm oil
- Liver
- Kidneys
- Small fish eaten whole
- Fish oils
- Egg yolks
- Breastmilk (especially colostrum)
- Fortified milk
- Butter and cheese

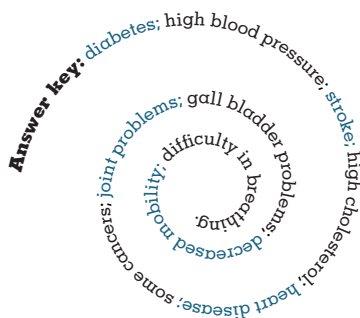




# Problems related to obesity



- blindness
- diabetes
- marasmus
- high blood pressure
- scurvy
- neural tube defects
- high cholesterol
- stroke
- wasting of the muscles and tissues
- heart disease
- some cancers
- joint problems
- decreased mobility
- mental retardation
- gall bladder problems
- dwarfism (severe growth retardation)
- difficulty in breathing
- pellagra
- kwashiorkor



# Overweight and obesity: true or false?

Take this quick  
quiz to test your  
knowledge.

	True	False
1. Eating less food (calories) than we need for physical activity and body processes leads to overweight and obesity.	<input type="checkbox"/>	<input type="checkbox"/>
2. There are fewer overweight and obese people around the world today than in the past.	<input type="checkbox"/>	<input type="checkbox"/>
3. Obesity does not result in any life-threatening health problems and physical disabilities.	<input type="checkbox"/>	<input type="checkbox"/>
4. Over 1 billion people in the world are overweight.	<input type="checkbox"/>	<input type="checkbox"/>
5. Over 300 million people are obese.	<input type="checkbox"/>	<input type="checkbox"/>
6. The rate of obesity among children is rapidly increasing.	<input type="checkbox"/>	<input type="checkbox"/>
7. Obesity can shorten a person's life.	<input type="checkbox"/>	<input type="checkbox"/>
8. Obesity is an extreme form of overweight.	<input type="checkbox"/>	<input type="checkbox"/>



Answer key: 1 False; 2 False; 3 False; 4 True; 5 True; 6 True; 7 True; 8 True



# What we get from food



What we get from food is about the nutrients we get from foods and how important it is for proper growth and development and prevention of disease to eat the right variety and the right amounts of foods that provide these nutrients. It explains the functions of carbohydrates, protein, fats, vitamins and minerals in the body and their importance in the diet. It provides some examples of foods that are good sources of these nutrients.



**Lesson 4**  
Learning about carbohydrates, protein and fats



**Lesson 5**  
Learning about vitamins and minerals





## LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- name and describe the three macronutrients and explain their main functions in the body;
- identify locally available foods that are good sources of each macronutrient;
- assess the amount of carbohydrates, protein and fats in your diet.

## Lesson 4

# Learning about carbohydrates, protein and fats

## LESSON OVERVIEW



This lesson is about the importance of carbohydrates, protein and fats (called the macronutrients) in a healthy, balanced diet.

It explains how people need the right amounts of these macronutrients for proper growth, development and good health. The three macronutrients are discussed one by one and can be studied in three different sessions. The lesson begins with talking about carbohydrates that provide fuel for activity, growth and body functions. It then examines the vital role of protein in the basic body functions. Finally, it discusses how fats are essential for proper growth and good health, and describes the different types of fats. For each macronutrient, some examples of foods that are good sources are provided and research of locally available foods rich in each of these nutrients is encouraged.



**Part 1**

# Carbohydrates: their functions and good food sources



## READING

Food contains many different nutrients that help the body function well; most foods are a mixture of different nutrients. The body cannot produce these nutrients, so they must be obtained from the food we eat. The nutrients in foods are grouped by their similar characteristics and the functions that they carry out in the body. Certain nutrients are called “macro” nutrients because the body needs them in fairly large amounts in order to function properly; these are carbohydrates, protein and fats. Other nutrients, also necessary for body functions, are called “micro” nutrients because the body needs them in very small amounts; these are vitamins and minerals. A nutrient can perform one or several functions in the body. Adequate amounts of both macro and micro nutrients are needed for proper growth, development, good health and prevention of disease.

Water is not classified as a macronutrient or micronutrient, but is essential for health and life. Water makes up a large part of our body weight and is the main component of our body fluids. The body needs more water every day than any other nutrient. Water carries nutrients throughout the body, provides lubricants and cushions for the joints and the eyes, eliminates wastes, and helps maintain body temperature and regulate many body processes. We lose water every day and our bodies do not store extra water, so we need to replenish water through the foods and liquids we eat and drink.

### TO THINK ABOUT WHILE READING



What does the word ‘macronutrient’ mean?

What do carbohydrates give us?

Do you know what foods are main sources of carbohydrates?

The three macronutrients – carbohydrates, protein and fats – are the major source of energy and bulk (volume) in our diets. They are the only nutrients that contain energy from food, which is measured in calories. Energy in our food is necessary for activity, growth and other body functions such as thinking, digesting and metabolizing food (all reactions of the body to use food), breathing, and circulating blood and oxygen. Getting sufficient energy is essential for everyone in order to maintain body growth and development and good health. Energy is so important to survival that we have developed the ability to store it for future use in the form of fat if we take in more than we need at the moment. (Another source of energy, alcohol, is not an essential nutrient needed by the body, but it can contribute a significant number of calories to the diet.) Carbohydrates, protein and fats, in addition to providing energy, each have very specific functions in the body and must be supplied in sufficient amounts to carry out those functions.



## Carbohydrates

**Carbohydrates provide the body's main source of energy.** Plants make carbohydrate from sunlight (photosynthesis) as a way to store the sun's energy for its own use. When we eat the plant, we are able to use that stored energy. The major role of carbohydrates is to provide energy to every cell in the body. The energy we get from eating carbohydrates provides the fuel we need for our activities and growth. Carbohydrates are necessary for the brain to function; they help muscles work better. Some of the carbohydrates we eat are broken down and used for energy the body needs for physical activity; some are used for growth and overall maintenance and for the renewal of body tissues.

### *Food sources*

**In general, carbohydrates come from plants.** Foods rich in carbohydrate are rice, maize, wheat, millet, sorghum and other cereals, foods made from cereals, all types of root crops such as potatoes, yams and cassava, legumes such as peas and beans, vegetables, fruits and sugars. Many of these foods also provide essential vitamins and minerals.

### *Types of carbohydrates*

**Carbohydrates are found in three forms: sugar, starch and fibre.** Each form of carbohydrate serves different purposes and is important in our diets. A healthful diet includes at least half of daily calories from carbohydrates (50–65%), with plentiful starch and fibre and limited sugar.

**Sugar is quickly absorbed into the body and used for energy.** There are many types of sugars and commonly used names for sugars. It is found naturally in fruits, milk, honey and the sap of certain trees. It is also made from the processing of sugar cane or beets into table sugar or other sweeteners to be added to foods. Sugar, in addition to providing calories for energy, improves the flavour, texture and appearance of foods, is used in food preservation (as in jam), and in cooking and baking foods.

While fruit contains sugar, it also provides water, fibre and important vitamins and minerals that increase its nutritional benefits. Honey does contain a few vitamins and minerals, but not enough to offer nutritional benefits, since the total amount eaten is usually small. As consuming large amounts of sugars or sweetened foods may lead to reducing intake of other foods containing important nutrients, it is recommended to limit consumption of concentrated sweets, but not of foods such as fruits or milk that naturally contain sugar.

**Starch is broken down by the body into simple sugars to be absorbed.** Starchy foods stay in the body's system longer than sugar, giving a sense of feeling "full" for a longer period of time. However, starch is eventually



broken down. Starch provides the majority of the calories we eat and starchy foods are widely grown and usually available in sufficient amounts to provide the main energy source in most diets. Plants that contain starch, or foods made from starchy plants, form the basis of most diets. Because the refining of starchy foods can sometimes cause important nutrients to be lost or destroyed, it is recommended that unrefined foods be included in the diet as much as possible. For instance, whole grains (as in whole wheat bread) have many more nutrients than refined grains (as in refined white bread).

*Starch is found in:* grains (rice, corn/maize, wheat, millet, oats), roots and tubers (potatoes, cassava, yams), legumes (peas and beans), and certain fruits (breadfruit, banana/plantain, water chestnut).






Fibre is a carbohydrate portion of a plant that the body cannot digest and absorb. This makes fibre very important for “cleaning out” the digestive track as it passes through the body. Fibre can absorb water and help get rid of the body’s waste products. Different types of fibre exist in foods; some are more “woody” and do not dissolve in water, as can be seen in the hard stems of some vegetables. Some are more “gummy”, dissolve in water and exist in the skins and peelings of fruits and vegetables. Each type of fibre has different properties, but all are important for good health. Fibre may help prevent certain diseases such as heart disease, cancer and diabetes. While not eating enough fibre can cause constipation and other intestinal problems, eating too much fibre can cause nutrients to pass through the system too quickly to be absorbed.

*Foods containing fibre are:* wholegrain cereals, starchy roots, fruits, most vegetables, beans, peas and other legumes and oilseeds.

Foods that have had little processing or refining have the greatest amount of fibre, as well as higher amounts of vitamins and minerals, which are often lost during refining.



### **MATERIALS**

-  Fact sheet *Basic macronutrient facts: carbohydrates*
-  Ask yourself work sheet *Carbohydrates in my diet*
-  Answer work sheet *Carbohydrates in my diet*
-  Match it work sheet *Carbohydrates facts matching*
-  Work sheet *Carbohydrates around the world*



## ACTIVITIES

### Carbohydrates in my diet



Go to the Ask yourself work sheet *Carbohydrates in my diet* and fill in what you know about the different types of carbohydrates and the carbohydrates in your foods and diet.

Check the answer checklist to see if your answers are correct.



**Tip:** Look for more information on carbohydrates in the Fact sheet *Basic macronutrient facts: carbohydrates*.

### Carbohydrates collage



Look at the Fact sheet *Basic macronutrient facts: carbohydrates* and make a list of all carbohydrate foods available in your local diets and markets. Collect as many pictures of these foods as possible. You can draw local foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Once you have collected the images, work individually or in three groups and create a poster or a collage called “Main Sources of Carbohydrates”. Divide your poster into three parts: Sugary foods; Starchy foods; Fibre foods. Display the poster in your school for every student, teacher and parent to consult.

### Carbohydrates facts matching



*If you are working individually*, go to the Match it work sheet *Carbohydrates facts matching* to see if you can correctly match some facts about carbohydrates.

*If you are working in a group*, make three columns on a large sheet of paper or on the classroom board and write in the following three headings:

- A. Starch
- B. Sugar
- C. Fibre

Then, on separate strips of paper or cards write each of the facts listed in the work sheet. Mix up the facts and hand out the fact strips until they are all distributed. Each person reads out the fact strips one at a time and places it under the macronutrient column where they think they belong. Discuss and check the answer key to see if the placement is correct.

### Carbohydrates around the world

Some foods rich in carbohydrates form the basis of many peoples’ diets around the world. They are often called “staple” foods and are eaten regularly, almost at every



meal. Staple foods supply a major part of dietary energy. The main kinds of staple foods are:

- Cereals: rice, maize, wheat, rye, barley, oats, millet, sorghum
- Roots and tubers: potatoes, cassava, yams
- Legumes: beans, lentils, soybean

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East, North, Central and South America, Oceania. Conduct an investigation using the Internet, visiting a library, asking experts or using any other resources available, and find out what staple foods are commonly eaten in these countries.



Use your findings to fill in the Work sheet *Carbohydrates around the world*.

## Cooking competition

Divide into groups and cook a traditional dish based on the staple food from a different country or region. You can use the information gathered in the previous activity or check the Internet or other sources for recipes. Invite your friends and families to taste the dishes and select the winner. Take pictures of every dish, write the recipes next to the photos and create your “International Staple Foods” recipe book.



### KEY POINTS

**Review these four key points** to remember about carbohydrates, their functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

## Carbohydrates

- Carbohydrates provide the body’s main source of energy for activity, growth and body functions.
- Carbohydrates exist in three forms: sugar, starch and fibre.
- Foods rich in carbohydrates are all types of cereals, root crops, legumes, vegetables, fruits and foods containing sugars.
- Healthful diets include at least half of daily calories from carbohydrates, with foods containing plentiful starch, whole grains and fibre and limited amounts of sugar.





**Part 2**

# Protein: its functions and good food sources



## READING

Protein provides amino acids for basic body functions. Amino acids are combined in the body to create protein substances needed to form body tissues. The amino acids in protein are often referred to as the “building blocks” of life. Without protein, the most basic life functions cannot be carried out. Almost all of the cells in the body are constantly being broken down and then rebuilt; this process requires a steady supply of protein. Protein works in the body to build and repair body tissues such as muscles, bones and organs, blood, skin and hair and repairing damaged tissues due to illness or injury. It is necessary for clotting blood and for keeping the immune system strong by developing antibodies to fight disease.

Protein is also a major component of the body’s transportation system that carries oxygen and nutrients to all cells of the body. Sufficient protein is necessary to maintain proper fluid regulation; without protein to help fluids remain in their appropriate place in veins, arteries and cells, liquid can leak out into body extremities (feet and legs) and the abdominal cavity. (For example, this is what happens in Kwashiorkor.) During periods of high growth, such as pregnancy, infancy, childhood and adolescence, extra protein is needed to provide for extra tissue development, in addition to keeping up the normal maintenance and repair of existing tissue, hormones and enzymes.

When body energy levels are low, the body will use protein for energy, but this is not the best use of protein. This takes protein away from performing its specific important functions. If energy intake is low for a long period of time, protein will be used for energy by breaking down the tissues and organs to meet energy needs.

### *Food sources*

Protein is found in foods from both animal and plant sources, which provide different combinations of amino acids needed by the body. Because we need to replace the amino acids in the body as they are lost or used up by the body processes, we must eat foods that have the necessary amino acids to be used to manufacture body protein. To help provide all of the amino acids we need, it is important to eat a variety of foods of plant and animal origin.

### TO THINK ABOUT WHILE READING



Do you know  
why we need  
protein?

What foods are the  
best sources  
of protein?

How many kinds  
and servings  
of protein  
do you have  
in your diet?



*Foods from animal sources rich in protein are:* all types of meat, poultry, fish, eggs, milk, cheese and yoghurt.

*Foods from plant sources high in protein are:* dried beans, peas, lentils and other legumes, nuts, pumpkin seeds and soybean.



## MATERIALS



Fact sheet *Basic macronutrient facts: protein*



Ask yourself work sheet *Protein in my diet*



Answer work sheet *Protein in my diet*



Work sheet *Foods rich in protein*



Work sheet *Protein around the world*



## ACTIVITIES

### Protein in my diet



Go to the Ask yourself work sheet *Protein in my diet* and fill in what you know about the importance of protein and protein in your diet and the foods you eat.



**Tip:** Look for more information on protein in the Fact sheet *Basic macronutrient facts: protein*.



Check the Answer work sheet *Protein in my diet* to see if your answers are correct.

### What foods are rich in protein?



Go through the list of foods in the Work sheet *Foods rich in protein* and underline or circle all the best sources of protein. Use the Fact sheet *Basic macronutrient facts: protein* for more information on protein.



### Protein poster



Look at the Fact sheet *Basic macronutrient facts: protein* and make a list of all protein foods available in the local markets and diets. Collect as many pictures of these foods as possible. You can draw local foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Once you've collected the images, work together or in small groups and create a poster or a collage called "Main Sources of Protein". Display the poster in your school next to the one on carbohydrates created previously.



## Protein around the world

Traditional diets around the world include different foods rich in protein. They supply people with the building blocks of life – amino acids – and come from both animal and plant sources.

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East North, Central and South America, Oceania. Conduct an investigation using the Internet, visiting a library, asking experts or using any other resources available and find out what protein-rich foods are commonly eaten in these countries.



Use your findings to fill in the Work sheet *Protein around the world*.



### KEY POINTS

**Review these three key points** to remember about protein, its functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

### Protein

- Protein provides the “building blocks” of life – amino acids. Without protein, no life functions can be carried out. Life itself would not be possible.
- To meet the body’s protein needs, it is important to eat a variety of foods from both animal and plant sources.
- Foods rich in protein are all types of meat, fish, poultry, eggs, milk and milk products, dried beans and peas and other legumes and nuts.



**Part 3**

## Fats: their functions and good food sources



### READING

Fats provide energy and carry out a variety of important functions in the body. Dietary fats supply essential fatty acids that are needed for the absorption of vitamins A, D, E and K (called “fat soluble” vitamins). They contain the highest level of energy (9 calories per gram) of any nutrient and are essential for growth and health. Fat is also a necessary component of body tissue. The brain and central nervous system are rich in fat and fat must be sufficient in the diet in times when these tissues are developing, as in pregnancy and the first several years of life. The body uses fat to manufacture needed chemicals such as hormones. Fats protect the cells and internal organs and allow us to store calories to protect us from times when food is not available. Fats stay in the stomach longer than other foods, making us feel full. Fats are also important for keeping the body warm and they make food taste better.

A healthy, well-balanced diet includes adequate fat intake. For people with inadequate total energy intake, dietary fats are especially important for increasing energy intake to more adequate levels. For everyone, adequate fat is an important part of a healthy diet that meets individual energy and nutrient needs and takes into account appropriate levels of physical activity. Fat needs are usually expressed as a percentage of total energy needs, which depend on age and levels of physical activity.

The percentage of total energy (calories) that should come from fat in a healthy, balanced diet is:

- Infants 0–6 months: 40–60%
- Infants 6–24 months: gradual reduction to 35%
- Children 2–18 years: 25–35%
- Adults: 20–35%, with the higher limit for more active adults
- Pregnant and lactating women: 20–35%

### Types and sources of fat

Dietary fats are found naturally in foods of both plant and animal origin. Almost all foods contain some fat, even if only very small amounts. Not all fats are the same, and there is increasing evidence that the type of fat in the diet has important effects on health and may be more important to health than the total amount of fat in the diet.

#### TO THINK ABOUT WHILE READING



Do you think  
fats are important  
in the diet?

What do you  
know about  
the different kinds  
of fats?

Do you know  
what foods have  
high amounts  
of fats?



The fatty acids in fats can be grouped into unsaturated fatty acids (including monounsaturated and polyunsaturated) and saturated fatty acids. Two of the polyunsaturated fatty acids we need cannot be made by the body and must come from the foods we eat; these are called “essential fatty acids”. Saturated fats and monounsaturated fats can be made by the body. Unsaturated fats are liquid at room temperature, while saturated fats are solid at room temperature. The fats we eat have a mixture of these different kinds of fatty acids, each of which has different effects on the body. Fats made from plant foods tend to have a higher proportion of unsaturated fatty acids. Animal fats (with the exception of some fish) tend to have a higher proportion of saturated fatty acids.

### *Unsaturated fatty acids*

Two of the unsaturated fatty acids are called “essential fatty acids” because they are essential for health and because it is essential that we get them from the food we eat, since the body cannot make them. The body uses these essential fatty acids to make the others that it needs.

In this group of essential fatty acids, the omega-3 fatty acids have several important health benefits:

- help lower the risk of coronary heart disease and stroke
- reduce inflammation, which is helpful for asthma and reducing the effects of arthritis
- have a critical role in brain function and normal growth and development

*Sources of monounsaturated fats are:* canola oil; peanut oil; olive oil; avocados; nuts, such as almonds, hazelnuts and pecans; and seeds such as pumpkin and sesame seeds.

*Sources of polyunsaturated fats are:* sunflower oil; corn oil; soybean oil; flaxseed oil; walnuts, flaxseeds; and fish. Fatty fishes, including salmon, trout, mackerel, herring, sardines, pilchards, kipper, eel, whitebait, tuna, anchovies, swordfish, bloater, cacha, carp, hilsa, jack fish, katla and sprats, are rich in omega-3 fatty acids.

### *Saturated fatty acids*

Saturated fatty acids are found in many animal foods and in some plants; they are also made by the body. Individual saturated fatty acids act differently in the body and may have different health effects. For example, high intakes of some animal fats may increase the risk of coronary heart disease, while red palm oil, coconuts and coconut oil, also saturated fats, do not increase the risk. (Red palm oil is also a good source of vitamins A and E). Replacing saturated fatty acids in the diet with monounsaturated or polyunsaturated fatty acids and consuming less than 10% of calories from saturated fatty acids (8% for children) is associated with a lower risk of cardiovascular disease.



*Sources of saturated fatty acids are:* foods from animal products, such as beef, pork, cheese, butter, ghee, lard, suet or other cooking fat from animal sources, whole milk, cream, fats from meat or meat products. Plant sources include coconut and red palm oil.

### *Transfatty acids*

When vegetable oils are processed to make them harder, some of the fatty acids are changed into transfatty acids. Transfatty acids are present in margarine, shortening, other solid fats and in commercially fried and baked foods (such as biscuits, cakes, chips), where they are called “partially hydrogenated oils”. Transfats have been found to contribute to heart disease and may contribute to other health problems, such as diabetes. These fats and foods containing these fats should be avoided or consumed as little as possible (less than 1% of calories).

### *Cholesterol*

Cholesterol is a fat-like substance that occurs naturally in animal foods; vegetables and vegetable products do not contain cholesterol. The body also makes it. We need some cholesterol for our bodies to grow and function properly. There are different kinds of cholesterol in the blood, including:

- HDL “good” cholesterol (high-density lipoprotein).  
High levels of “good” cholesterol seem to reduce the risk of heart disease.
- LDL “bad” cholesterol (low-density lipoprotein).  
High levels of “bad” cholesterol seem to increase the risk of heart disease.







Individual saturated fatty acids have different effects on the levels of good and bad cholesterol in the blood. Some saturated fatty acids may raise or lower cholesterol levels; others do not have any effect on it. For example, choosing foods with monounsaturated fatty acids and omega-3 fatty acids over saturated fatty acids is beneficial because unsaturated fatty acids tend to decrease the level of bad cholesterol. Choosing foods with transfatty acids over foods with saturated fatty acids is not beneficial, because transfatty acids decrease the level of good cholesterol and increase the level of bad cholesterol.

In general, it is recommended that:

- most of the fat in the diet comes from unsaturated fatty acids, including oils, seeds, nuts and fatty fish that provide omega-3 fatty acids;
- small amounts come from saturated fatty acids (less than 10% of calories in the diet for adults and 8% for children); and
- transfats and foods containing transfats (partially hydrogenated oil) be avoided or consumed as little as possible (less than 1% of energy).



## MATERIALS

-  Fact sheet *Basic macronutrient facts: fats*
-  Ask yourself work sheet *Fats in my diet*
-  Answer work sheet *Fats in my diet*
-  Work sheet *What foods are high sources of fats?*
-  Work sheet *Fill in the gaps*
-  Match it work sheet *Macronutrients facts matching*



## ACTIVITIES

### Fats in my diet



Go to the Ask yourself work sheet *Fats in my diet* and fill in what you know about the different types of fats and the fats in your foods and diet. Check the Answer work sheet to see if your answers are correct.



*Tip:* Look for more information on fats in the Fact sheet Basic macronutrient facts: fats.

### What foods are good sources of fats?



Go through the list of foods in the Work sheet What foods are good sources of fats and underline or circle all those rich in fats. Use the Fact sheet Basic macronutrient facts: fats for more information on fats.

### Fats poster



Look at the Fact sheet Basic macronutrient facts: fats and make a list of all the fats and foods high in fats available in the diet and local markets. Collect as many pictures of these foods as possible. You can draw foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Once you've collected the images, work all together or in groups and create a poster or a collage called "Main sources of fats". Divide your poster in three parts: Unsaturated fats; Saturated fats, Transfats.

If food labels are available with nutrient amounts listed, analyse the types and amounts of different fats listed on the label and rank foods with greater or lesser amounts.



Display the poster in your school next to the ones on carbohydrates and proteins created previously.

## Fill in the gaps



*If you are working individually*, use the Work sheet *Fill in the gaps* as a test and see if you can correctly fill in the blanks.

*If you are working in a group*, copy the sentences and the words in the box on separate strips of paper or cards. Mix up the cards and, one at a time, come up and take one or more random cards until they are all distributed.

Walk around the room and try to match your cards. When you have filled in the blanks in the sentences with the correct words, form a pair and read aloud your statements to the rest of the group. Check the answer key to see if they are correct.

## Macronutrients matching game



*If you are working individually*, go to Match it work sheet *Macronutrients facts matching* and see if you can match the facts with the correct macronutrient.

*If you are working in a group*, make three columns on a large sheet of paper or on the classroom board and write in the following three headings:

- A. Carbohydrates
- B. Protein
- C. Fats

Then on separate strips of paper or cards write each of the facts listed on the work sheet. Mix up the facts and distribute the fact strips until all facts are distributed.

Read out the fact strips one by one and place them under the macronutrients where you think they belong. Discuss and check the answer key to see if the placement is correct.



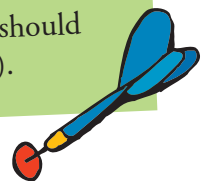
### KEY POINTS

#### Review these five key points

to remember about fats, their functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

## Fats

- Fats carry out many important functions in the body. They help the body absorb certain vitamins, produce hormones and build body tissues. Fats are important for the development of the brain and the central nervous system.
- Adequate fat is an important part of a healthy diet that meets individual energy and nutrient needs and takes into account appropriate levels of physical activity.
- Most of the fat in the diet should come from unsaturated fats, especially from seeds, nuts and fatty fish that provide omega-3 fatty acids.
- Small amounts should come from saturated fatty acids (less than 10% of calories in the diet for adults and 8% for children).
- Transfats and foods containing transfats (partially hydrogenated oil) should be avoided or consumed as little as possible (less than 1% of calories).





# Basic macronutrient facts: carbohydrates

## Nutrient

### Carbohydrates

Carbohydrates provide the body's main source of energy (calories). Carbohydrates exist in three forms: sugar, starch and fibre.

## Function

Provide energy needed by the body for activity, growth, body functions, maintenance and renewal of body tissues.

## Food sources

Carbohydrates are found in many foods, but mainly foods from plants. Foods rich in carbohydrates are: rice, millet, maize, wheat, sorghum and other cereals; mealie meal, foods made from grains, such as breads, crackers, pastas and noodles; all types of starchy root crops, such as potatoes, yams, cassava; peas, beans and other legumes.

### Sugar

Sugar is quickly absorbed into the body and used for energy. Excess consumption of sugar may contribute to overweight and obesity.

Provides a concentrated source of energy.

Sugar is found naturally in certain foods and saps of trees and is also made from the processing of sugar cane or beets. Sources are: fruits, fruit juices, milk, sweetened drinks, white and brown table sugar, honey, corn syrup and other syrups, molasses, baked cookies, cakes, candies and other sweetened foods.

### Starch

Starch is broken down by the body into simple sugars to be absorbed.

Natural foods containing starch provide energy and offer more vitamins and minerals than simple sugars.

Wheat, rice, maize, oats, dry beans and peas, starchy roots and tubers, such as potatoes, yams and cassava; starchy fruits, such as breadfruit, banana, plantain, water chestnuts and sweet chestnuts.

### Fibre

Fibre is a form that the body cannot digest and absorb. It absorbs water and helps get rid of the body's waste products.

Keeps the digestive system healthy, clean and functioning properly. Reduces blood cholesterol levels and normalizes blood sugar levels. Important for the prevention of certain diseases (cancer, heart disease, diabetes).

Whole grains, such as oats, barley, rye; brown rice; beans, chickpeas, lentils, nuts, most vegetables and fruits (especially with the peel).



You can look for more information on Fact sheet **Basic macronutrient facts: protein** and Fact sheet **Basic macronutrient facts: fats**



# Carbohydrates in my diet

Fill in what you know  
about the different types of  
carbohydrate and  
identify their role in your  
food and diet.

1. How many forms of carbohydrate are found in plants?

.....

2. What are these forms?

.....

## Sugar

3. What is the main function of sugar?

.....

4. What sugars and sugary foods or beverages do you eat or drink?

.....

.....

5. Which foods naturally contain sugar?

.....

.....

6. Which plants provide us with extracted (processed) sugars?

.....

7. What do all sugars and sugary foods and drinks have in common?

.....

8. Why should we not eat too much sugar or sugary foods?

.....

.....

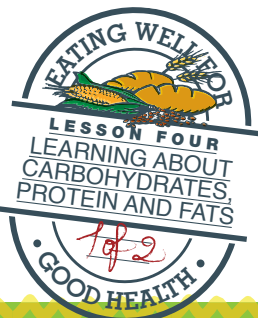
9. Think about how much sugar or sugary foods you eat.

.....

10. What are the recommendations for consuming sugar and sugary foods?

.....

.....



★ You can check your answers on  
Answer work sheet **Carbohydrates in my diet**

★ You can look for more information on  
Fact sheet **Basic macronutrient facts: carbohydrates**

**Starch**

11. What are the sources of starch? What starchy foods do you eat?

.....  
.....

12. What role do starchy foods play in the diet?

.....  
.....

13. Think about how much of the total food you eat comes from starchy foods.

.....  
.....

14. What are the recommendations for eating starchy foods?

.....  
.....

**Fibre**

15. How is fibre different from the other carbohydrates?

.....  
.....

16. What types of fibre are there?

.....  
.....

17. What are good sources of fibre?

.....  
.....

18. What health problems can be prevented thanks to fibre?

.....  
.....

19. What happens to fibre during processing or refining?

.....  
.....

20. Think about how much fibre you eat.

.....  
.....

21. In which ways can you add more high-fibre foods to your diet and local recipes?

.....  
.....





# Carbohydrates in my diet

## Questions

## Answers

- |  |                         |
|--|-------------------------|
| 1. How many forms of carbohydrate are found in plants? | Three                   |
| 2. What are these forms?                               | Sugar, starch and fibre |

## Sugar

- |  |   |
|--|---|
| 3. What is the main function of sugar?                                 | Concentrated source of energy.  |
| 4. What sugars and sugary foods or beverages do you eat or drink?      | These include: brown or white table sugar; honey; fruits; fruit juice; milk, corn syrup and other syrups, molasses, baked cookies, cakes, biscuits or other sweet desserts; soft drinks; candies, chocolate, jam, ice-cream and other sweetened foods |
| 5. Which foods naturally contain sugar?                                | Honey, milk, tree sap, fruits, especially bananas, prunes, dates, pineapples, oranges, grapes   |
| 6. Which plants provide us with extracted (processed) sugars?          | Sugar cane and sugar beet   |
| 7. What do all sugars and sugary foods and drinks have in common?      | They taste sweet and provide energy   |
| 8. Why should we not eat too much sugar or sugary foods?               | They are high in calories; eating large amounts may result in eating less of other foods higher in important nutrients.   |
| 9. Think about how much sugar or sugary foods you eat.                 | Individual reflection   |
| 10. What are the recommendations for consuming sugar and sugary foods? | It is recommended to limit consumption of concentrated sweets, but not of foods such as fruits or milk that naturally contain sugar   |

*Continued*



★ Use this to check your answers to  
Work sheet Carbohydrates in my diet

**Questions**

**Answers**

**Starch**

- |  |   |
|--|---|
| 11. What are the sources of starch? What starchy foods do you eat?           | Grains (wheat, rice, corn/maize, oats, millet), legumes (dry beans and peas), roots and tubers (potatoes, yams, cassava); starchy fruits (breadfruit, banana, plantain, water chestnuts, sweet chestnuts) |
| 12. What role do starchy foods play in the diet?                             | They are major staple foods around the world, providing the main food source in the diet for most people.   |
| 13. Think about how much of the total food you eat comes from starchy foods. | Individual reflection   |
| 14. What are the recommendations for eating starchy foods?                   | It is recommended that starchy foods provide at least half of the calories in the diet. It is also recommended to eat starchy foods as "whole" unrefined foods whenever possible.                         |

**Fibre**

- |   |   |
|---|---|
| 15. How is fibre different from the other carbohydrates?                            | Fibre is not absorbed by the body and does not provide calories. It helps to "clean out" the digestive tract as it passes through the body.                                 |
| 16. What types of fibre are there?  | "Woody" fibre found in the hard stems of some vegetables and "gummy" fibre found in the peelings of fruits and vegetables.  |
| 17. What are good sources of fibre?   | Whole grains, such as oats, barley, rye; brown rice; starchy roots, peas, beans, chickpeas, lentils, nuts, oilseeds, most vegetables and fruits (especially with the peel). |
| 18. What health problems can be prevented thanks to fibre?                          | Fibre helps prevent constipation and may help prevent heart disease, diabetes and certain types of cancer.  |
| 19. What happens to fibre during processing or refining?                            | Processing or refining can reduce the amount of fibre foods provide, and can also reduce the amount of vitamins and minerals they contain.                                  |
| 20. Think about how much fibre you eat.   | Individual reflection   |
| 21. In which ways can you add more high-fibre foods to your diet and local recipes? | Individual reflection   |



# Carbohydrates facts matching

Can you correctly match some facts about carbohydrates?

1. Used in food preservation
  2. Staple food that fills us up
  3. Cannot be digested or absorbed by the body
  4. Provides the body's main source of energy
  5. Helps the digestive system keep clean
  6. Improves flavour and appearance of foods
  7. May help prevent diseases such as heart disease, cancer and diabetes
  8. A source of concentrated energy
  9. It is recommended to eat fewer foods with high concentration of this
  10. Absorbs water and helps get rid of body waste
  11. Easily absorbed and used for quick energy
  12. It is recommended to eat it unrefined
- A. Starch
- B. Sugar
- C. Fibre





# Carbohydrates around the world

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East, North, Central and South America, Oceania. Conduct an investigation using any resources available to you and find out what staple foods are eaten in these countries. Use this table to record your findings.

**Staple foods**

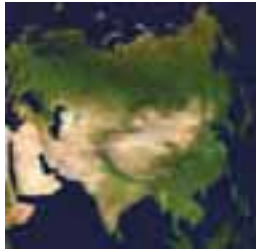
**Traditional dishes or foods based on these staples**

**Africa**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

**Asia and the Pacific**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

**Europe**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

**Latin America and the Caribbean**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |



**Staple foods**

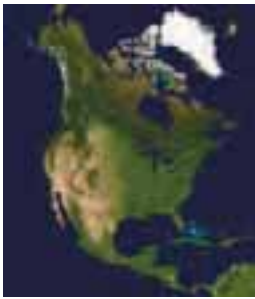
**Traditional dishes or foods based on these staples**

**Middle East**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

**North America**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

1. What kinds of staple foods are available in different regions of the world?
2. What are the most popular staple foods around the world?
3. Did you learn about any unusual foods that are not eaten in your country or region?
4. Do you eat a variety of all of the staple foods available in your country or region?
5. Can you include any new staple foods from the table in your diet?





# Basic macronutrient facts: protein

## Nutrient

### Protein

Protein provides amino acids, called the “building blocks” of life, needed for basic body functions.

## Function

Protein is essential for many basic body functions:

- helps in growth and development
- helps in building and repair of muscles, bones, organs, blood, skin, hair
- repair of damaged tissues due to illness or injury
- needed for the regulation of body fluids and hormones
- blood clotting
- helping the immune system fight disease.

## Food sources

Found in both animal and plant foods, but best sources are animal foods, including all meats and offal, fish, chicken, eggs, animal milks, cheese and yoghurt. Good plant sources include groundnuts, soybeans, pumpkin seeds, dried beans, peas, medlies and lentils.



Reading this fact sheet will help you to complete Work sheet **Protein in my diet**, and Work sheet **Foods rich in protein**

You can look for more information on Fact sheet **Basic macronutrient facts: carbohydrates** and Fact sheet **Basic macronutrient facts: fats**



# Protein in my diet

Fill in what you know about the importance of protein and protein in your diet and the foods you eat.

1. What are the functions of protein?

.....

.....

.....

2. Why is extra protein needed during periods of high growth such as pregnancy, infancy, childhood and adolescence?

.....

3. What protein foods do you eat?

.....

.....

.....

4. Do you think you get enough protein? Too much? Too little?

.....

5. Do you get your protein more from plant foods or from animal foods?

.....

6. Do you get your protein from a variety of different protein-rich foods?

.....

7. How could you add different protein foods to your meals to be sure to meet your protein needs?

.....

.....

.....



You can check your answers on the Answer work sheet **Protein in my diet**



Look for more information on Fact sheet **Basic macronutrient facts: protein**



# Protein in my diet

## Questions

## Answers

- |   |   |
|---|---|
| 1. What are the functions of protein?   | It helps in growth and development; in building tissues and repairing damaged ones, in maintaining proper fluid regulation, and is also necessary for clotting blood and keeping the immune system strong to fight disease. |
| 2. Why is extra protein needed during periods of high growth such as pregnancy, infancy, childhood and adolescence? | To provide for the extra tissue developed during this time.   |
| 3. What protein foods do you eat?   | May include: all meats, fish, chicken, eggs, animal milks, cheeses, yoghurt, groundnuts, soybeans, pumpkin seeds, dried beans, peas, mealies and lentils.   |
| 4. Do you think you get enough protein? Too much? Too little?   | Individual self reflection  |
| 5. Do you get your protein more from plant foods or from animal foods?  | Individual self reflection  |
| 6. Do you get your protein from a variety of different protein-rich foods?  | Individual self reflection  |
| 7. How could you add different protein foods to your meals to be sure to meet your protein needs?                   | Eating even a small amount of an animal protein each day can provide the amino acids missing from plant foods.  |



★ Use this to check your answers to Work sheet Protein in my diet



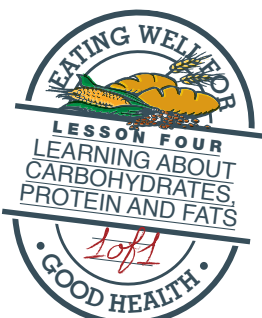
# Foods rich in protein

Do you know which foods are rich in protein?  
Circle the foods that are the best sources of protein.

lamb  
seafood  
chicken  
beef  
sugar  
fruits  
veal  
liver  
turkey  
candies  
lentils  
chickpeas  
duck  
salmon  
yoghurt  
groundnuts (peanuts)  
ham  
pork  
margarine  
carrots  
cookies  
potatoes  
walnuts  
olive oil  
bread  
pasta  
dried beans  
banana  
cabbage  
fish  
sausage  
cottage cheese  
pumpkin seeds  
cassava  
peas  
soybeans  
bacon  
cakes  
sunflower seeds  
onion  
honey  
eggs  
milk  
tofu  
cheese  
sardines  
almonds  
rice

Answer key: Beef; yoghurt; lamb; walnuts; pork; tofu; veal; bacon; chickpeas; seafood; chicken; groundnuts; turkey; peas; duck; salmon; lentils; sardines; sunflower seeds; almonds; dried beans; cottage cheese; milk; eggs; ham; pumpkin seeds; liver; fish; soybeans; sausage; cheese; sardines; almonds; soybeans; sardines; almonds; sunflower seeds; cottage cheese; milk; eggs; salmon; duck; peas; turkey; groundnuts; chicken; seafood.

You can look for more information on protein on Fact sheet Basic macronutrient facts: protein





# Protein around the world

Choose a country located in each of the following regions: Africa, Asia, Europe, Middle East, North Central and South America, Oceania. Conduct an investigation by using any source available to you and find out what protein-rich foods are commonly eaten in these countries. Use this table to record your findings.

## Protein-rich foods

## Traditional dishes or foods rich in protein

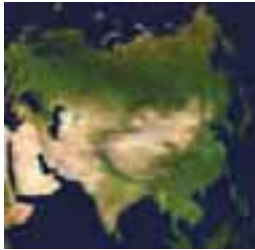
### Africa



- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....

### Asia and the Pacific



- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....

### Europe



- .....
- .....
- .....
- .....

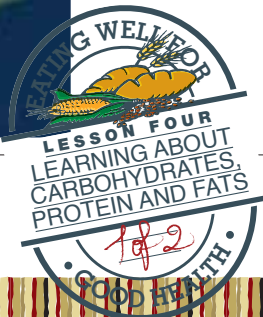
- .....
- .....
- .....
- .....

### Latin America and the Caribbean



- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....



**Protein-rich foods**

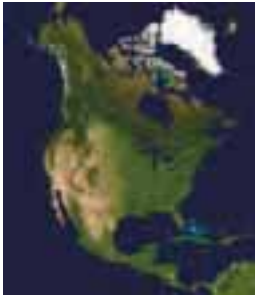
**Traditional dishes or foods rich in protein**

**Middle East**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

**North America**



- |         |         |
|---------|---------|
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |
| • ..... | • ..... |

1. Which sources of protein are available in different countries and regions of the world?
2. What are the most popular protein-rich foods around the world?
3. Did you learn about any unusual foods that are not eaten in your country or region?
4. Do you eat a variety of protein-rich foods available in your country?
5. Can you include any new protein-rich foods from the table in your diet?



# Basic macronutrient facts: fats

## Nutrient

### Fats

Fats provide a concentrated source of energy for the body and supply the essential fatty acids needed for growth and health. There are different kinds of fatty acids, each of which has a different effect on the body.

#### **Unsaturated fats**

Some of these have properties that make them beneficial to health, including reducing the risk of heart disease.

#### **Saturated fats**

High amounts of some of these increase the risk of heart disease; others do not.

#### **Transfats**

Contribute to heart disease and possibly to other health problems.

## Function

- Help build cells, especially cells of the brain and nervous system.
- Are needed for the body to absorb, store and circulate vitamins A, D, E and K.
- Some fats help reduce the risk of heart disease.
- Provide insulation against cold.
- Protect internal organs and cells.
- Store calories to be used when food is scarce.

## Food sources

Most vegetable oils such as, sunflower, linseed, flaxseed, groundnut and olive oil and other oils made from seeds, and groundnuts, soybeans, kidney beans, sunflower seeds, sesame seeds and other oil seeds, oily/fatty fishes such as salmon, sardines, trout, mackerel, herring and tuna; walnuts and avocados.

Butter, ghee, and other animal cooking fats, whole milk, cream, cheese, fats from meat and meat products, poultry. Also red palm oil and coconuts (that provide vitamins A and E and do not increase risk of heart disease).

Margarine and vegetable ghee, lard/cooking fat, fried foods, commercially fried and baked goods, cakes, biscuits.



★ You can look for more information

on Fact sheet **Basic macronutrient facts: carbohydrates** and Fact sheet **Basic macronutrient facts: protein**

★ Reading this fact sheet will help you to complete

Work sheet **Fats in my diet** and Work sheet **What foods are high sources of fats?**

# Fats in my diet

Fill in what you know about the different types of fats and identify them in your diet and in the foods you eat.

1. What are the functions of fats?  
.....  
.....
2. What vitamins are absorbed, stored and circulated with the help of fats?  
.....  
.....
3. Which body tissues are composed of fats?  
.....  
.....
4. How do fats protect us from times when food is not available?  
.....  
.....
5. What foods do you eat that are high in fat?  
.....  
.....
6. What are the different types of fats?  
.....  
.....
7. What health benefits or health problems are associated with each type of fat?  
.....  
.....
8. Do you think you get enough fat? Too much? Too little?  
.....  
.....
9. How much of each type of fat do you have in your diet? Do you get more unsaturated, saturated or transfat?  
.....  
.....
10. What changes can you make in your foods and your meals to be sure you eat more "healthy" fats and meet your body's need for fat?  
.....  
.....



★ You can check your answers on Answer work sheet *Fats in my diet*

★ You can look for more information on Fact sheet *Basic macronutrient facts: fats*



# Fats in my diet

## Questions

1. What are the functions of fats?
2. What vitamins are absorbed, stored and circulated with the help of fats?
3. Which body tissues are composed of fats?
4. How do fats protect us from times when food is not available?
5. What foods do you eat that are high in fat?
6. What are the different types of fats?
7. What health benefits or health problems are associated with each type of fat?
8. Do you think you get enough fat? Too much? Too little?
9. How much of each type of fat do you have in your diet? Do you get more unsaturated, saturated or transfats?
10. What changes can you make in your foods and your meals to be sure you eat more "healthy" fats and meet your body's need for fat?

## Answers

- Fats are used to build cells, manufacture hormones, help the body absorb and use certain vitamins. Fats protect our cells and internal organs and provide insulation against the cold. Some fats help protect the body from heart disease.
- Fat-soluble vitamins: A, D, E and K
- The brain and the central nervous system.
- They store calories to be used when food is scarce.
- May include: oils, groundnuts, soybeans, seeds, oily/fatty fishes such as salmon, sardines and tuna, walnuts and avocados, coconuts, butter, margarine, ghee, lard and other cooking fats, whole milk, cream, cheese, fats from meat and meat products, poultry, fried foods, commercially fried and baked goods, cakes, biscuits.
- Unsaturated, saturated and transfats.
- Some unsaturated fats (omega-3) can reduce the risk of heart disease. Transfats contribute to heart disease and possibly other health problems. High levels of "bad" (LDL) cholesterol may increase risk of heart disease.
- Individual self reflection
- Individual self reflection
- Most of the fat in the diet should come from unsaturated fats. Foods containing saturated fats should be eaten in limited quantities. Foods containing transfats should be avoided.



★ Use this to check your answers  
to Work sheet **Fats in my diet**





# Fill in the gaps

Can you fill in the gaps?  
Complete each sentence  
by choosing the correct  
word from the box.

Liquid    Solid    Avoid    Unsaturated    Animal    Trans

1. Saturated fats are ..... at room temperature.
2. Most of the fat in the diet should come from ..... fats.
3. Saturated fats are found primarily in ..... foods.
4. Some ..... fats have important health benefits.
5. Unsaturated fats are ..... at room temperature.
6. .... fats contribute to heart disease.
7. People should ..... eating foods containing transfats.
8. Fats made from plant foods tend to have a higher proportion of ..... fatty acids.



Answer key: 1 solid; 2 unsaturated; 3 animal; 4 unsaturated; 5 liquid; 6 trans; 7 avoid; 8 unsaturated.

# Macronutrients facts matching

**How much have you learned about the macronutrients? See if you can match each fact with the correct macronutrient...**

1. It should be at the basis of our diet
2. Called the "building blocks of life"
3. Forms cushions in the body, protects internal organs and provides insulation against cold
4. Plants make it from sunlight
5. Contains 9 calories per gram
6. Oil is made of this
7. Made up of amino acids
8. Fibre is a form of this
9. Meat is the major source of this
10. Help absorb the fat-soluble vitamins
11. Starch is a form of this
12. Butter is made of this
13. Important for growth and repair of tissues, keeping immune system strong and maintaining fluid balance
14. It is the most concentrated form of energy
15. Sugar is a form of this
16. It is the most calorie-dense nutrient

- A.** Carbohydrates
- B.** Protein
- C.** Fats



**Answer key:** 1A; 2B; 3C; 4A; 5C; 6C; 7B; 8A; 9B; 10C; 11A; 12C; 13B; 14C; 15A; 16C.



## LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- name and describe the essential vitamins and minerals and their main functions in the body;
- identify locally available foods that are good sources of each of the essential vitamins and minerals;
- assess the amount and variety of vitamins and minerals in your diet.

## Lesson 5

# Learning about vitamins and minerals

## LESSON OVERVIEW



This lesson is about the importance of eating foods that provide essential vitamins and minerals for proper growth and development and to help prevent disease. It explains that our bodies require many different vitamins and minerals, each of which has a specific function in the body and must be supplied in different, sufficient amounts. Vitamins and minerals are discussed separately and can be studied in two different sessions. The lesson describes the essential vitamins and minerals, their functions and good food sources. It pays special attention to those vitamins and minerals that are most likely to cause serious health problems when people do not get enough of them from their food: vitamins A, D, C, the B-complex vitamins and folate and the minerals calcium, iron, iodine and zinc.



**Part 1**

# Vitamins: their functions and good food sources

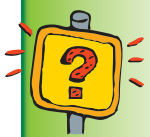


## READING

Vitamins and minerals in foods are necessary for the body to grow, develop and function properly. They are needed in very small (micro) but specific amounts, but they are essential for our health and well-being. These micronutrients work together with the macronutrients we eat (carbohydrates, protein and fats) to provide energy, build and maintain tissues and to regulate all of the body's processes. Vitamins and minerals are needed to help the body perform specific functions that promote growth, reproduction, and help maintain health and life. Our bodies require a number of different vitamins and minerals, each of which has a specific function in the body and must be supplied in different, sufficient amounts. During times of rapid growth, such as during pregnancy and lactation, early infant and child growth and during periods of certain illnesses, it is especially important to get enough vitamins and minerals. The best way to ensure that we get enough of each of the vitamins and minerals we need is to eat a balanced diet that includes a variety of different foods.

Vitamins are needed for essential body processes and help the body stay healthy. The word vitamin comes from “vita”, the Latin word for life, indicating their importance to the various body processes. Essential vitamins are organic compounds made by plants and animals that we cannot produce ourselves so they must be taken in through the foods we eat. Each vitamin has a very specific function and not getting enough of each one can lead to the development of serious health problems and diseases. Some vitamins help us turn the carbohydrates, protein and fats we eat into the energy our bodies use. Other vitamins help build healthy tissues and hormones, even though they are not components of those body tissues. Some vitamins are protective, helping our immune systems fight against infection and serving as antioxidants, protecting cells and tissues from damage. Vitamins are divided into two types: “fat soluble” vitamins, which dissolve in fat, and “water soluble”, which dissolve in water.

### TO THINK ABOUT WHILE READING



What does the word vitamin mean to you?

Do you know why we need vitamins?

Do you know what foods are good sources of different vitamins?

## Fat soluble vitamins

Fat soluble vitamins cannot dissolve in water or body fluids. Because these vitamins do not dissolve in water and are stable to heat, they are less likely to be lost in cooking and other food processing. Any excess amounts of these vitamins are stored in various tissues and organs as a reserve for future use by the body and are not lost through urine. As fat soluble vitamins are not eliminated by



the body, taking high amounts of these vitamins can cause them to build up in the body, which can be harmful. Eating normal amounts of foods rich in the fat soluble vitamins is not likely to be harmful.

The four fat soluble vitamins are Vitamin A, Vitamin D, Vitamin E and Vitamin K. They perform many functions, including the development, health and functioning of various tissues and systems, such as the eyes, skin, lungs, bone, teeth, nervous system, immune system and blood. They interact with each other and with certain minerals to perform their functions. While all of the fat soluble vitamins are important for good health, two of them – A and D – are discussed in detail below, as deficiencies of these two vitamins are more common and can lead to serious health problems.



**See** Fact sheet *Vitamins, their functions and good food sources* for more information on vitamins E and K.

**Vitamin A is essential for the normal growth and development of cells and is especially important for good vision, healthy skin and mucous membranes, bone formation, growth, immunity and reproduction.** It is involved in many body processes and helps regulate cell growth and division. Vitamin A helps keep us healthy by promoting healthy skin and surface membranes, which help keep bacteria and viruses out of our bodies, and by strengthening the immune system to help fight infections. Vitamin A is also important for good eyesight and vision, including protecting against eye damage resulting from eye infections, and preventing night blindness. Severe vitamin A deficiency early in life can lead to permanent blindness caused by damage to the cornea, the transparent surface of the eye.

Eating a healthy, well-balanced diet containing a variety of foods rich in vitamin A can help meet the body's needs for vitamin A and can help prevent blindness, infections and other health and growth problems that can result from insufficient vitamin A. As fat is needed for the body to absorb vitamin A, it is important to include adequate fat in the diet, along with other nutrients such as iron, zinc and adequate protein. Early detection and treatment of vitamin A deficiency and of measles, malaria, diarrhoea and malnutrition is important for preventing serious health problems. In situations where foods rich in vitamin A are not available or in cases of severe deficiency, foods fortified with vitamin A and vitamin A supplementation may be recommended.

Vitamin A exists in several forms. Pre-formed vitamin A (retinol) is found in foods of animal origin and is easily absorbed by the body. Another form of vitamin A is manufactured by the body from substances (certain carotinoids) in certain plant foods.

*Best sources of pre-formed vitamin A are:* animal livers and other organs. Other good food sources of vitamin A are: milk and milk products (not skimmed), butter and eggs.



*Best sources of carotinoids for the manufacture of vitamin A are:*

brightly coloured deep yellow and orange fruits and vegetables such as carrots, orange sweet potatoes and yams, pumpkins, some tree fruits such as mango and peaches, and dark green leafy vegetables, such as spinach and other leaves.



**See** Fact sheet *Vitamin A deficiency* for more detail on what it is, who is at risk and how to treat and prevent it.

Vitamin D works together with calcium and other minerals and vitamins to help bones grow in density and strength. Vitamin D also has other important functions, including helping the immune system, the brain and the nervous system, the skin, muscles and cartilages, the kidneys, intestines and the reproductive organs. Not enough vitamin D can cause poor bone growth (rickets) in children and soft bones in adults. Low levels of vitamin D can decrease the body's ability to fight against infections.

*The best source of vitamin D* is the body's own production of it through exposure of the skin to sunlight. It is the only nutrient that the body can synthesize. It is found naturally in only a few foods, including egg yolks, liver and fatty fish and their oil. Some countries add vitamin D to foods such as milk, butter and margarine.

## Water soluble vitamins

Water soluble vitamins dissolve in water and are not stored by the body. Any excess of water soluble vitamins are passed out of the body through urine. Water soluble vitamins are generally more fragile than fat soluble vitamins and are easily damaged or lost in food cooking and storage. Since these vitamins are not stored in the body, they must be taken in on a regular basis to meet the body's needs. The water soluble vitamins are the eight different B-complex vitamins and vitamin C.

The B-vitamins help every cell in the body to generate energy from the carbohydrates, proteins and fats in foods and to use these nutrients to build and repair tissue. Each B-vitamin has a specific role in this process, but their functions overlap and work together, so they are often talked about as a group: the B-vitamins. Four of the B-vitamins – B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> and folate are discussed in detail below, as they are associated with problems in human health.



**See** Fact sheet *Vitamins, their functions and good food sources* for more information on the B-vitamins.





**Vitamin B<sub>1</sub> (Thiamine)** works primarily with carbohydrates to produce energy. It plays a role in the transmission of nerve impulses and is needed for the muscular, cardiovascular and gastrointestinal systems. Prolonged thiamine deficiency results in a condition called beri-beri, which is associated with heart problems, muscle weakness, mental disorders and memory loss. People who have a high carbohydrate intake but low amounts of thiamine, such as people who eat a lot of highly milled or polished rice, are at particular risk. Alcoholics and breastfed infants of thiamine-deficient mothers are also at high risk.

*Best sources of thiamine are:* liver, pork, whole unrefined grains and some fruits. Thiamine is water soluble and fragile and is easily destroyed in cooking.

**Vitamin B<sub>2</sub> (Riboflavin)** is required to release energy from carbohydrates, protein and fats in body cells. It promotes growth, good vision and healthy skin, and is important for foetal bone, muscle and nerve development. An infant born to a mother with Vitamin B<sub>2</sub> deficiency is at risk of anaemia, poor digestive function, poor bone formation, and a suppressed immune system. Riboflavin may be deficient when food intake is low and is usually seen together with other nutrient deficiency problems. Signs of lack of riboflavin include dryness and swelling around the corners of the mouth and eyes, red, itchy eyes and sensitivity to light.

*The best sources of riboflavin are:* milk and dairy products such as cheese and yoghurt; liver is also a very high source of riboflavin. Grains and some vegetables are fair to good sources.

**Vitamin B<sub>3</sub> (Niacin)** is similar to thiamine and riboflavin in its importance in getting energy from carbohydrates, protein and fats in all cells. Niacin helps maintain a healthy skin, digestive tract and nervous system. Diets poor in niacin can result in pellegra, a disease often referred to as “The Three D’s”, because it can cause Dermatitis (flaky skin), Dementia (anxiety, delirium) and Diarrhoea. The risk of pellagra is increased in diets based almost entirely on maize, with little variety and low protein. However, soaking maize in lye (caustic soda) before cooking helps make niacin in maize more available for absorption (as in the traditional home preparation of tortillas).

*Best sources of niacin are:* chicken, beef, tuna and other fish, mushrooms, bran, enriched grains and cereals, groundnuts (peanuts), asparagus and green leafy vegetables. Niacin can also be made in the body from an amino acid in protein foods (tryptophan), so diets rich in protein from animal origin and legumes are usually sufficient in niacin.

**Folate (Folic acid)** is essential for helping cells multiply and for building and repairing body tissues. It works with other micronutrients to help the body break down, use and create new proteins and produce nucleic acids (DNA), the genetic



material required by all cells. Rapidly dividing cells are particularly vulnerable to folate deficiency. Maintaining adequate folate intake is essential for a healthy supply of red blood cells and the normal growth and development of a baby during pregnancy.

A folate deficiency before and during pregnancy can result in very serious birth defects of the brain and spinal cord (neural tube defects, or NTDs) in the developing baby. Because this damage occurs in the first few weeks of pregnancy, it is recommended that women who could become pregnant increase their consumption of folate before and during pregnancy. The need for folate in preparation for and during pregnancy can be met by consuming at least 5 servings a day of vegetables and fruits rich in folate. Women who are not able to meet their need for folate through their diet and women who have another child with NTDs are advised to eat foods fortified with folate or take folate supplements, in addition to eating folate-rich foods. Folate deficiency can lead to anaemia at any stage of life.

*The best sources of folate:* Folate gets its name from the Latin word, folium, which means “leaf”, as leafy green vegetables such as spinach and broccoli are excellent sources of folate. Liver, dried beans and peas, lentils and other legumes, and other vegetables and fruits, especially citrus, are also excellent sources. Meats, milk and milk products are fair sources of folate. Cereals and breads that have been fortified with folate are also good sources.

**Vitamin C is important for the health of tissues and acts like the “cement” to hold cells and tissues together.** It helps form collagen, the structural protein of connective tissues, which is necessary for forming bones and teeth and for forming scars on wounds (“gluing” wounded tissues together). In the cells and body fluids, vitamin C protects tissues from stress and may help reduce the risk of chronic disease. It also helps the body absorb iron and may strengthen some components of the immune system that help fight infections. Prolonged vitamin C deficiency can lead to scurvy, which is characterized by loose teeth, leaking of fluids from the tissues, failure to form healthy scar tissues, difficulties in bone rebuilding and bleeding in internal organs. If treated in time, these conditions can be reversed through consuming vitamin C-rich foods; it can be fatal if not treated in time.

Vitamin C is not stored in the body, so foods containing vitamin C should be eaten very often. It is also destroyed by heat and air, so foods need to be fresh and eaten with the shortest amount of cooking or other processing.

*The best sources of vitamin C are:* fruits and most vegetables, including potatoes (with skin). Oranges, lemons, limes, tangerines, grapefruits (citrus fruits), guavas, strawberries, kiwis, tomatoes, sweet peppers, broccoli and leafy greens are especially high in vitamin C.



## MATERIALS



Fact sheet *Vitamins, their functions and good food sources*



Ask yourself work sheet *Vitamins in my diet*



Answer work sheet *Vitamins in my diet*



Match it work sheet *Vitamins matching game*



Quiz work sheet *Vitamins: Who am I?*



## ACTIVITIES

### Vitamins in my diet



Go to the work sheet *Vitamins in my diet* and fill in what you know about vitamins and the importance of vitamins in your foods and in your diet.



*Tip:* Look for more information on vitamins on the Fact sheet *Vitamins, their functions and good food sources*.

### Vitamins matching game



Go to the Match it work sheet *Vitamins matching game*. Can you match the vitamins with their functions and food sources?



*Tip:* Look for more information on vitamins on the Fact sheet *Vitamins, their functions and good food sources*.

### Vitamins: Who am I?



*If you are working individually,* use the *Who am I?* questions to test what you have learned about vitamins.



*If working as a class:*

1. Write the questions one at a time on the classroom board or a large sheet of paper.
2. Read out the question and ask for volunteers to answer it.
3. Discuss whether the answer is the correct one and write the correct answer on the board or paper next to the question.



*If working in teams:*

1. Write each of the Who am I? questions on individual strips of paper or cards.
2. Divide into two or more groups, depending on the size of the class.
3. Distribute randomly to each team the Who am I? questions until all questions have been given out.



4. Allow the teams enough time to read their questions among themselves and agree on the answers. In turn, each team reads out loud one question and the answer the team has agreed on. The other team or teams judge whether the answer is correct or not. This continues until all of the questions have been read out and answered by the teams. Points can be given for correct answers and subtracted for incorrect answers.

*Tip:* Additional Who am I? questions can be created using the tables and fact sheets provided in the lesson.

## Vitamins collage



Look at the Fact sheet *Vitamins, their functions and good food sources* and make a list of all vitamin-rich foods available in your local markets and diets. Discuss which of these foods you eat and how often you eat them.

Collect as many pictures of these foods as possible. You can either draw local foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Divide into two teams, show the images of foods to each other and try to guess which vitamins are highest in which foods. The teams get a score for each correct guess and lose a point for each wrong answer.

After the game, work all together or in two groups and create a poster or a collage “Main sources of vitamins”. Divide your poster in two parts: Fat-soluble vitamins; Water-soluble vitamins. Display the poster in your school for every student, teacher and parent to consult.



### KEY POINTS

**Review these five key points** to remember about vitamins, their functions in the body and good food sources. See if your knowledge has improved and how you can apply it to your own diet and that of your family.

## Vitamins

- Vitamins are vitally important for our health and life and must be supplied in small but sufficient amounts through the foods we eat. Lack of any vitamin in a diet can cause serious health problems and diseases.
- Vitamin A is important for eyesight, the immune system, reproduction and growth. Foods rich in vitamin A are orange and yellow fruits and vegetables, green leafy vegetables, milk, eggs, liver and other organs.
- Vitamin D helps the bones, immune system, brain, nervous system, skin, muscles, and reproductive organs. Its best source is the body’s own production through exposure to sunlight.
- The eight B-vitamins are important in processing energy, regulating body functions, building and repairing tissues. Folate is essential in preventing serious birth defects. Foods rich in B-vitamins are all meats, liver, fish, eggs, nuts, seeds, legumes and green leafy vegetables.
- Vitamin C is important for the health of tissues and acts like the “cement” to hold cells and tissues together and may reduce the risk of disease. Foods rich in vitamin C are fruits and most vegetables.



**Part 2**

## Minerals: their functions and good food sources



### READING

Minerals are needed to form body structures and regulate chemical reactions. They are taken up from the soil into plants and used by animals and people when they eat the plants. Like vitamins, minerals are needed in small amounts and do not provide energy. Also much like vitamins, minerals are required to regulate many body processes, such as heartbeat, nerve response and reactions, blood clotting, fluid regulation and energy metabolism (release of energy from food). Minerals form part of the structure of bones, teeth, nails, muscles and red blood cells. Minerals cannot be broken down or changed by our bodies and are not destroyed by heat or air.

Each essential mineral is important and although some are needed in only very small amounts, the body does not function properly unless all are supplied in sufficient quantities. Eating a varied and balanced diet is the best way to be sure to have a diet sufficient in required minerals. The minerals currently known to be essential in human nutrition are: calcium, iron, iodine, phosphorus, potassium, sodium, chlorine, magnesium, sulphur, fluoride, zinc, manganese, chromium, cobalt, molybdenum, copper and selenium. While all of these minerals are important for good health, four of them – calcium, iron, iodine and zinc – are discussed in detail below, as deficiencies of these four essential minerals are more common and can lead to serious health problems.

### TO THINK ABOUT WHILE READING



What does the word mineral mean to you?

Do you know why we need minerals?

Do you know what foods are good sources of different minerals?



**See** Fact sheet *Minerals, their functions and good food sources* for more information on the functions and good food sources of the essential minerals.



**See** Fact sheet *Problems of poor nutrition and their signs and effects* for more information on nutritional problems resulting from a lack of some of these minerals.

## Calcium

Calcium is essential for healthy bone growth and for nerve and muscle functions; it may protect against high blood pressure. Calcium is the most abundant mineral in the body. Most of the calcium in the



body is located in the bones, providing a “storage bank” to maintain maximum calcium storage throughout life. Stored calcium is released into the body when needed to maintain a constant level in the blood for important body functions such as muscle movements (contract and relax) and transmitting nerve impulses. Without an exact level of calcium in the blood, our heart would not be able to beat and we would not be able to breath or move.

**Adequate calcium intake is important at all stages of life.** In childhood and adolescence, it is particularly important to eat and drink calcium-rich foods to ensure maximum calcium storage and strong bones. This is because calcium is most easily absorbed into the bones until late adolescence, after which the ability to store calcium slows down and becomes more difficult. Calcium needs are high during pregnancy, when the infant’s bones are developing, and even more so in breastfeeding, when high levels of calcium are passed to the baby through the breastmilk. Later in life, when storage levels are low, it is also important to increase calcium in the diet in order to protect bones from further calcium loss and to prevent osteoporosis, a disease resulting from lack of calcium, in which bones become weak and brittle and can easily break.

*The best sources of calcium are:* milk, cheese and yoghurt; small fresh or dried fishes with the bones and fish sauces containing the fish bones; white beans; tofu (soybean); almonds and sesame seeds. Some vegetables and leafy greens, such as broccoli and spinach, contain calcium, but large quantities of these foods must be eaten to ensure sufficient calcium.

## Iron

Iron is needed in the blood and muscles as part of the system that carries oxygen throughout the body to be used for energy production in the cells. Iron is also involved in getting energy from carbohydrates, protein and fats and is needed for making amino acids and body tissues. Iron needs are greatest during periods of growth and development, so infants, children and pregnant women have the highest needs. Iron deficiency anaemia, which occurs when iron is low, contributes to deaths in pregnancy and childbirth and can result in poor growth and development, low resistance to disease, poor reproductive functions and lower resistance to infections leading to increased illness.



See Fact sheet *Iron deficiency anaemia* for more information on what it is, who is at risk and how to prevent and treat it.

*Sources of iron:* Iron is found in both animal and plant foods, but the iron in animal foods is in a form that is very easy for the body to absorb and use, while iron from plant foods is not as easily absorbed or used by the body. Good animal sources of iron are: meat, especially red meat, liver, eggs, fish and



poultry. Plant sources of iron include beans, soybeans and tofu, leafy green vegetables, dried fruits and foods fortified with extra iron, such as enriched bread. Vitamin C can help the body's ability to absorb iron, so eating iron-rich foods together with foods such as lemons, limes, oranges, grapefruits, tomatoes and strawberries will increase the iron we get from foods. Other food components, such as phytates in bran and tannins in teas, can inhibit the absorption of iron and other minerals.

## Iodine

Iodine is necessary for the body to make the thyroid hormone which regulates many body systems, including: temperature, growth, blood cell production, nerve and muscle development. Iodine is essential for the normal growth, development and functioning of the brain and body. When iodine is low in the diet, the thyroid gland works hard to try to produce enough thyroid hormone. This results in the gland becoming enlarged, a condition called goitre. Lack of sufficient iodine is the most common cause of preventable mental retardation and brain damage in the world. Severe iodine deficiency during pregnancy can result in permanent mental and physical defects in the baby and increased risk of stillbirths (babies born dead) and infant deaths.

Iodine occurs naturally in the soil and in plants in many parts of the world, especially in coastal areas, but is absent in many other places. Because iodine cannot be stored in the body for very long, some amount of iodine must be consumed regularly. While many people can meet their iodine needs from food, people who live in areas where food is grown in soil that does not contain sufficient iodine, or who do not have access to seafood which is high in iodine, are at risk of being iodine-deficient. In areas where the food supply is deficient in iodine, it is often added to salt. Many countries require all salt to be iodized in order to prevent the serious and permanent problems caused by iodine deficiency.

*The best sources of iodine are:* seafood and saltwater fish, seaweed and iodized salt. Good vegetable sources, if they are grown in iodine-rich soil are garlic, soybeans, spinach and turnip greens.



**See** Fact sheet *Iodine deficiency* for more information on what it is, who is at risk and how to prevent and treat it.

## Zinc

Zinc is involved in over 100 chemical reactions in the body. It works with proteins in the body, helps keep cells strong, assists the immune system to keep us free from illness and is necessary for normal growth and development. It is needed to produce the active form of vitamin A in the eye and is important for healing cuts and wounds and for a normal sense of taste. Lack of sufficient zinc



can interfere with the proper functioning of many organ systems, including the central nervous system and the brain, especially when it occurs during infancy, childhood and pregnancy.

*The best sources of zinc are:* fish and shellfish (oysters, crab, shrimp), red meats and liver. Good sources are poultry, eggs. Whole grains and legumes can be good sources if eaten in large quantities.



**See Lesson 3** for information on problems caused by lack of essential vitamins and minerals.

## Fortified foods and dietary supplements

The vitamin and mineral needs of most people can be met through a good, varied diet. In circumstances in which people do not have a sufficiently varied diet, or are not able to digest and absorb nutrients adequately because of illness, or during periods of increased need, such as pregnancy, breastfeeding and early childhood, fortified foods or dietary supplements may be recommended. In the case of severe deficiencies, supplements (in the form of a pill, tablet or liquid) are usually recommended, in addition to increasing consumption of foods rich in micronutrients. For example, among populations with high levels of vitamin A deficiency or during a measles outbreak, a vitamin A supplement may be given to infants and children and to women after the birth of a baby. Vitamin A can be added to milk and some vegetable oils. Iodine is added to salt in many countries to prevent iodine deficiency, and the B-vitamins and iron are often added to flour, bread and other cereal products. While low consumption and absorption of essential vitamins and minerals can result in deficiencies and undesirable health conditions, excessively high intakes through excess supplements can also have adverse health effects. Before taking dietary supplements, the overall intake of a specific vitamin or mineral from all food sources needs to be considered and a doctor or other health care provider should be consulted.



### MATERIALS



Fact sheet *Minerals, their functions and good food sources*



Ask yourself work sheet *Minerals in my diet*



Answer work sheet *Minerals in my diet*



Match it work sheet *Minerals matching game*



Quiz work sheet *Minerals: Who am I?*





## ACTIVITIES

### Minerals in my diet



Go to the Work sheet *Minerals in my diet* and fill in what you know about minerals and the importance of minerals in your foods and in your diet.



*Tip:* Look for more information on vitamins on the Fact sheet *Minerals, their functions and good food sources*.

### Minerals matching game



Go to the Match it work sheet *Minerals matching game*. Can you match the minerals with their functions and food sources?



*Tip:* Look for more information on minerals on the Fact sheet *Minerals, their functions and good food sources*.

### Minerals: Who am I?



*If you are working individually,* use the *Minerals Who am I?* questions to test what you have learned about minerals.

*If working as a class:*

1. Write the questions one at a time on the classroom board or a large sheet of paper.
2. Read out the question and ask for volunteers to answer it.
3. Discuss whether the answer is the correct one and write the correct answer on the board or paper next to the question.



*If working in teams:*

1. Write each of the Who am I? questions on individual strips of paper or cards.
2. Divide into two or more groups, depending on the size of the class.
3. Distribute randomly to each team the Who am I? questions until all questions have been given out.
4. Allow the teams enough time to read their questions among themselves and agree on the answers. In turn, each team reads out loud one question and the answer the team has agreed on. The other team or teams judge whether the answer is correct or not. This continues until all of the questions have been read out and answered by the teams. Points can be given for correct answers and subtracted for incorrect answers.



*Tip:* Additional Who am I? questions can be created using the tables and fact sheets provided in the lesson.

### Minerals collage



Look at the Fact sheet *Minerals, their functions and good food sources* and make a list of all foods rich in calcium, iron, zinc and iodine available in your local



markets and diets. Discuss which of these foods you eat and how often you eat them.

Collect as many pictures of these foods as possible. You can draw local foods, take photos of them or cut out the illustrations from food labels, packages, newspapers or magazines.

Divide into two teams, show the images of foods to each other and try to guess which minerals are in which foods. The teams get a score for each correct guess and lose a point for each wrong answer.

After the game, work all together or in two groups and create a poster or a collage “Main sources of minerals”. Display the poster in your school for every student, teacher and parent to look at.



### KEY POINTS

**Review these five key points** to remember about minerals, their functions in the body and good food sources. See if you feel that your knowledge has improved and how you can apply it to your own diet and that of your family.

## Minerals

- Each essential mineral is important and although some are needed in only small amounts, the body does not function properly unless all are supplied in sufficient amounts. Lack of any essential mineral can cause serious health problems and diseases.
- Calcium is essential for strong bones and teeth and is necessary for nerve and muscle functions. Foods rich in calcium are milk, yoghurt, cheeses, some small fishes with bones and leafy green vegetables.
- Iron carries oxygen through the body and is important for proper growth and development and resistance to infections. It is especially important for women during pregnancy and childbirth, and for infants and children. Food rich in iron are red meats, liver, fish, poultry and eggs.
- Iodine is essential for normal growth, development and functioning of the brain and body. It is especially important for preventing mental retardation, brain damage and serious defects during pregnancy. Best sources of iodine are seafood, saltwater fish, seaweed and iodized salt.
- Zinc helps keep cells strong, assists the immune system and is critical for normal growth and development. It is important for the proper functioning of the central nervous system and the brain, especially during infancy, childhood and pregnancy. Best sources of zinc are fish and shellfish, red meats and liver.



# Vitamins, their functions and good food sources

*“Vitamins are needed to enable the body processes to work properly and to help the body stay healthy.”*

**Fat soluble vitamins** are stored by the body in fat cells; they do not dissolve in water or body fluids.

## Function

Vitamin A

Essential for good eyesight, skin, reproduction and growth, tissues of the respiratory and digestive tracts and proper function of the immune system in fighting infections. Aids in the growth and reproduction of hair, bones and teeth. May help in protecting the body against certain forms of cancer.

Vitamin D

Helps build and maintain teeth and bones and enhances calcium absorption. Helps the immune system, the brain, the nervous system, the skin, muscles and cartilage, reproductive organs and red blood cells. Helps regulate blood pressure and may play a role in preventing some cancers.

Vitamin E

Helps form red blood cells, muscles and other tissues. May help in protecting the body against certain forms of cancer and in reducing the risk of heart disease.

Vitamin K

Assists in blood clotting and needed for bone formation.

## Good food sources

Orange vegetables like carrots, pumpkins and red/yellow peppers, ripe mangoes, papayas (papaws), yellow/orange sweet potatoes, yellow maize and yellow bananas (if eaten in large amounts), cantaloupe, apricots. Broccoli, green leafy vegetables such as spinach, amaranthus and kale, fresh unbleached red palm oil, liver and kidneys, fish liver oils, small dried fish eaten whole, egg yolks, breastmilk (particularly colostrum), fortified milk, butter and cheese.

Exposure to sun enables body to make its own vitamin D. Small amounts are found in eggs, liver, veal, beef, fatty fish and their oil; greater amount in fortified milk and margarine.

Vegetable and seed oils: soybean oil, wheat germ oil, corn oil and sunflower oil. Leafy green vegetables, whole grains, liver, egg yolks, nuts, seeds and wheat germ.

Liver, green leafy vegetables and cabbage-type vegetables. Milk, meat, eggs, cereals, fruits and vegetables provide smaller, but still significant, amounts. Also made by bacteria in the digestive system.

*Continued*



Vitamins, their functions and good food sources (cont.)

## Water soluble vitamins are not stored in the body; they dissolve in water and excesses are eliminated.

### Function

Vitamin C	Helps bind tissues and cells together and strengthens blood vessel walls. Helps maintain healthy gums. Aids in the absorption of iron in plant foods. Acts as an antioxidant, which protects the cells. Strengthens resistance to infection.
B <sub>1</sub> (Thiamine)	Needed for carbohydrate metabolism and for the muscular, cardiovascular, nervous and gastrointestinal systems. Promotes proper nerve function. Especially important during pregnancy, breastfeeding and adolescence.
B <sub>2</sub> (Riboflavin)	Needed for metabolism of all foods and the release of energy to cells. Essential to the functioning of vitamin B <sub>6</sub> (Pyridoxine) and vitamin B <sub>3</sub> (Niacin).
B <sub>3</sub> (Niacin)	Needed in many enzymes that convert food to energy. Helps maintain a healthy digestive tract, nervous system and skin.
B <sub>5</sub> (Pantoic acid)	Helps in energy metabolism and in the manufacture of hormones and chemicals that regulate nerve function.

### Good food sources

Fresh fruits such as: guava, baobab, kiwi, mango, papaya, strawberries, cantaloupe and most vegetables including potatoes. Citrus fruits such as orange, lemon, grapefruit. Tomatoes, broccoli, green, red and yellow peppers. Fresh animal milk, breastmilk.
Liver, pork, yeast, whole unrefined grains, nuts, sunflower seeds, peas, watermelon, oatmeal, wheat germ and some fruits.
Liver, milk and other dairy products including cheese and yoghurt. Grains, green vegetables, such as broccoli, asparagus and spinach, mushrooms.
Chicken, beef, tuna and other fish, mushrooms, bran, enriched grains and cereals, groundnuts (peanuts), asparagus and green leafy vegetables, and all protein-containing foods.
Abundant in animal tissues, meat, fish, chicken and other poultry. Also in whole grain cereals, legumes, and mushrooms, avocados, broccoli.

Continued



## Vitamins, their functions and good food sources (cont.)

	Function	Good food sources
B <sub>6</sub> (Pyridoxin)	Needed for absorption and metabolism of protein and absorption of carbohydrates. Helps form red blood cells. Promotes nerve and brain function. Helps make body protein.	Meat, fish, poultry, eggs, green vegetables, avocado, spinach, broccoli, non-citrus fruits (prunes, bananas) liver, soy products, whole grain cereals, potatoes.
B <sub>12</sub> (Cobalamin)	Helps build new cells, including red blood cells. Helps keep nervous system healthy.	Found almost exclusively in animal flesh and products: all meats, organs/offal and poultry. Milk, cheese and eggs, fish and shellfish.
B <sub>8</sub> (Biotin)	Important in the metabolism of carbohydrates, fats and protein.	Found in almost all foods; especially good sources are organ/offal meats, egg yolks, soybeans, fish, whole grains.
Folate (Folic acid)	Essential for the production and maintenance of new cells. Especially important during pregnancy to prevent neurological and other birth defects and during infancy.	Best sources are green leafy vegetables: spinach, turnip greens, lettuces, dried beans and peas, sunflower seeds, fortified cereal products and liver. Smaller amounts found in meat, milk and milk products.



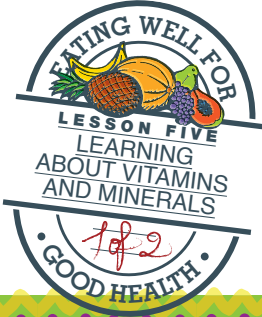
Reading this fact sheet will help you complete  
Work sheet **Vitamins in my diet**



# Vitamins in my diet

Fill in what you know about vitamins and their importance in your foods and in your diet.

1. Why are vitamins called micronutrients?  
.....  
.....  
.....
2. Can vitamins be seen or tasted?  
.....  
.....  
.....
3. Why do we need vitamins?  
.....  
.....  
.....
4. What can happen to a person who does not get enough of the essential vitamins?  
.....  
.....  
.....
5. What vitamins need fat in order to be absorbed by the body?  
.....  
.....  
.....
6. Why do we need to get water-soluble vitamins regularly from food?  
.....  
.....  
.....



7. Deficiencies of which vitamins are most likely to cause serious health problems if we do not get enough of them from our food?

.....  
.....  
.....

8. Do you think you get enough of the essential vitamins from the foods you eat?

.....  
.....  
.....

9. Do you eat a variety of different foods to be sure you get all of the vitamins you need?

.....  
.....  
.....

10. How can you add more foods rich in essential vitamins to your meals?

.....  
.....  
.....



★ Check your answers with the Answer work sheet **Vitamins in my diet**

★ You can look for more information on *Fact sheet* **Vitamins**, their functions and good food sources



# Vitamins in my diet

## Questions

1. Why are vitamins called micronutrients?
2. Can vitamins be seen or tasted?
3. Why do we need vitamins?
4. What can happen to a person who does not get enough of the essential vitamins?
5. What vitamins need fat in order to be absorbed by the body?
6. Why do we need to get water-soluble vitamins regularly from food?
7. Deficiencies of which vitamins are most likely to cause serious health problems if we do not get enough of them from our food?
8. Do you think you get enough of the essential vitamins from the foods you eat?
9. Do you eat a variety of different foods to be sure you get all of the vitamins you need?
10. How can you add more foods rich in essential vitamins to your meals?

## Answers

- Because they are needed in very small (micro) amounts.
- No
- Vitamins are necessary for many body processes. They help the body grow, stay healthy and function well.
- Lack of adequate amounts of essential vitamins can lead to the development of serious health problems and diseases.
- The four fat-soluble vitamins: A, D, E and K
- Water-soluble vitamins are not stored in the body. Any unused amounts of these vitamins are passed out of the body through urine. Therefore, they must be taken in on a regular basis.
- A, D, C, the B-complex vitamins and folate
- Individual reflection
- Individual reflection
- Individual reflection



This Answer work sheet  
will help you complete  
Work sheet **Vitamins in my diet**



# Vitamins matching game

Can you match the vitamins with their functions and food sources?

- Vitamin A
  - Vitamin D
  - Vitamin E
  - Vitamin K
  - Folate
  - Vitamin C
  - All water-soluble vitamins: B-complex and C
  - All fat-soluble vitamins: A, D, E and K
1. Works together with calcium to help bones grow well.
  2. Its precursor is found in dark yellow and leafy green vegetables such as carrots and sweet potatoes and deep yellow fruits such as peaches.
  3. Helps form red blood cells, muscles and tissues.
  4. Good food sources are cabbages and green salads, can be made by bacteria in the digestive track.
  5. Important for good eyesight and proper growth.
  6. Found naturally in very few foods. The best source is the body's own production of it through exposure of the skin to sunlight.
  7. Helps in blood clotting.
  8. Good food sources are dark green, yellow or orange vegetables and oil seeds.
  9. Important for production of cells. Essential during infancy and pregnancy to prevent birth defects.
  10. Need dietary fat to be absorbed in the body.
  11. Best sources are green leafy vegetables, dried beans and peas, sunflower seeds, fortified cereal products and liver.
  12. Very fragile: easily destroyed in cooking and storing.
  13. Helps bind tissues and cells together and strengthens blood vessel walls. Helps maintain healthy gums and protect the cells. Aids in absorbing iron.
  14. Citrus fruits (orange, lemon, lime, grapefruit), mango, papaya, tomatoes, red, yellow and green peppers are good sources.



Answer key: 1 Vit D, 2 Vit A, 3 Vit E, 4 Vit K, 5 Vit A, 6 Vit D, 7 Vit K, 8 Vit A, 9 Folate, 10 All fat soluble vitamins, 11 Folate, 12 All water soluble vitamins, 13 Vit C, 14 Vit C.

You can look for more information on Fact sheet **Vitamins, their functions and good food sources**

# Vitamins: who am I?

How well do you know  
your vitamins?  
See if you can name the  
correct vitamin for each  
“Who am I?” question.

1. I help keep your gums healthy and can help fight disease. I am found in oranges, lemons, limes, grapefruit and other citrus fruits. Who am I?  
.....
2. I am a B vitamin and I am especially needed during pregnancy to prevent birth defects. You can find me in green leafy vegetables. Who am I?  
.....
3. I help you to see well at night and help protect you against infections. I can be found in some foods of animal origin or made from carotenes found in yellow and orange-coloured fruits and vegetables. Who am I?  
.....
4. I help with red blood cells, muscles and tissue. I am found in many types of oils and nuts. Who am I?  
.....
5. I help to clot your blood when you get a cut. I am found in liver and green vegetables. Who am I?  
.....
6. I work with calcium to make your teeth and bones strong. You can get me from being in the sun and from eggs, liver and fish. Who am I?  
.....
7. We are a group of vitamins that helps your body with many functions. There are eight of us and we can be found in many of the same foods, especially grains. Who are we?  
.....
8. We need some fat to be absorbed in the body. Who are we?  
.....
9. We are eliminated through urine, so we need to be eaten regularly. Who are we?  
.....

★ More “Who am I” questions  
can be created using the  
Fact sheet **Vitamins, their functions  
and good food sources**



**Answer key:** 1 Vitamin C; 2 Folate; 3 Vitamin A; 4 Vitamin B and C; 5 Vitamin E; 6 Vitamin K; 7 The B-vitamins; 8 Fat-soluble vitamins A, D, E and K; 9 Water-soluble vitamins B and C.

# Minerals, their functions and good food sources

*“Minerals are needed to form body structures and regulate chemical reactions”*

Mineral	Function	Good food sources
Calcium	Helps build strong bones and teeth. Promotes muscle and nerve function. Helps blood to clot, aids in converting food to energy. May help prevent high blood pressure.	Milk, yogurt and cheeses. Sardines and other small fish (with bones), fish sauces with fish bones. Some vegetables and leafy greens, such as broccoli, chard, turnip greens and spinach, although large quantities are needed to ensure sufficient calcium. White beans, almonds, sesame seeds, tofu (soybean curd).
Chloride	Needed to help maintain pressure of fluids outside the cells and to maintain normal fluid balance. Is essential in the formation of acid (HCL) in the stomach and also aids in the transport of carbon dioxide (CO <sub>2</sub> ) by red blood cells.	High amounts in table salt, soy sauce. Moderate amounts in meats, including cured ham, and in milk, eggs and cheese. Large amounts in processed foods, and foods that contain sodium.
Chromium	Helps in the metabolism of carbohydrate, protein and fat. Works with insulin for proper glucose metabolism.	Egg yolks, meat, liver, whole grains, broccoli and green beans.
Cobalt	Main function is to prevent anaemia. It works with vitamin B <sub>12</sub> in the production of red blood cells, and to ensure the health of the nervous system.	Green leafy vegetables, meat, liver, milk, oysters and clams.
Copper	Necessary for the absorption and use of iron in formulation of haemoglobin. Needed to make red blood cells, connective tissue and nerve fibres, including making skin, hair and other pigments. May assist the immune system.	Seafood, nuts, organ/offal meats, whole grains and whole grain products, seeds and legumes.

Continued



## Minerals, their functions and good food sources (cont.)

Mineral	Function	Good food sources
Fluoride	Helps make teeth more resistant to acids and decay and to make bones stronger.	Drinking water, if fluoride-containing or fluoridated. Seafood such as sardines, salmon, cod, mackerel and shrimps. Tea and some fruit juices.
Iodine	Necessary for making the thyroid hormones that regulate body temperature, metabolic rate, reproduction, growth, red blood cells, and nerve and muscle function. Essential for the normal growth, development and functioning of the brain and body.	Highest sources: Iodized salt, seafood, saltwater fish, seaweed, such as kelp and dulse, white deep-water fish. Good sources from plants grown in iodine-rich soil: garlic, lima beans, sesame seeds, soybeans, spinach, summer squash, chard and turnip greens. Milk and milk products, if iodine is added to animal feed.
Iron	Primary function is to transport oxygen from the lungs through the body. It is an essential part of haemoglobin, the red substance in blood that carries oxygen throughout the body for use in energy production in the cells. Is needed for helping the immune system fight disease.	Best sources: red meats, including liver, fish, shellfish, poultry. Medium sources: eggs, legumes, including kidney beans, soybeans, tofu, leafy green vegetables. Apricots, almonds, sesame seeds, raisins.
Magnesium	Needed by cells for genetic material and bone growth. It helps maintain normal muscle and nerve function, keeps heart rhythm steady, helps blood clotting, supports a healthy immune system, and works with calcium to keep bones and teeth strong. Also helps regulate blood sugar levels, promote normal blood pressure, and helps in releasing energy in body.	High amounts in dark green vegetables such as spinach, leafy greens and broccoli, nuts and unrefined, whole grains. Medium amounts in meats and milk.
Manganese	Needed for normal bone formation. Important for metabolizing protein, fat and carbohydrate.	Nuts, whole grains and cereal products are the richest dietary sources. Adequate amounts are found in fruits and vegetables.

Continued



## Minerals, their functions and good food sources (cont.)



**This Fact sheet will help you complete  
Work sheet Minerals in my diet**

Mineral	Function	Good food sources
Molybdenum	Aids in metabolism and helps regulate iron storage.	Highest sources: legumes, such as beans, peas and lentils. Medium: grain products and nuts (depending on the soil content and other conditions.)
Phosphorous	Needed for energy metabolism, body chemistry, nerve and muscle function and is necessary for all growth. Part of the body system responsible for transmission of genetic information (DNA and RNA). Works with calcium to build bones and teeth.	All animal sources: milk, cheese, yoghurt and other milk products, meat, fish, poultry, eggs. Also some plant seeds and legumes (such as beans, peas, lentils), cereals and nuts.
Potassium	Helps maintain regular fluid balance inside the cells. Needed for nerve impulses, muscle contractions and promotes a steady heartbeat.	Highest sources are fruits and vegetables, such as bananas, plums and prune juice, orange and orange juice, tomatoes, spinach, green beans, mushrooms, broccoli and some squashes. Also, meats, milk, grains, legumes and sunflower seeds.
Selenium	Needed as an antioxidant that interacts with vitamin E to prevent breakdown of fats and body chemicals. Regulates thyroid hormone.	Seafood, kidney liver, chicken and other meats. Whole grains and vegetables (depending on soil content) including seeds, broccoli, brown rice, corn, garlic, onions, salmon, soybeans; dairy products. Molasses.
Sodium	Important for the regulation of fluid outside the cells, including blood plasma. Regulates blood volume and blood pressure. Assists in nerve impulse transmission, muscle contraction and heart function. Helps transport substances across cell membranes.	Sodium is found in virtually all foods, with processed foods generally having the most, and unprocessed foods such as fresh fruits and vegetables the least. Moderate amounts in meats, nuts, grains; low amounts in dairy products, depending on their processing. Added to food in the form of sodium chloride, or table salt.
Sulphur	Essential part of various amino acids, thiamine, insulin, biotin. Helps keep hair and nails strong and healthy and helps maintain elasticity in the skin.	Meat, milk, eggs and legumes.
Zinc	Helps in forming protein, important for growth and development, the immune system, neurological function, blood clotting and reproduction. Essential for digestion and metabolism. Assists in vitamin A activity.	High sources: Fish, beef and other red meats, shellfish (oysters, shrimp, crabs). Good sources: poultry, eggs, whole grains, nuts and legumes.



# Minerals in my diet

Fill in what you know about the minerals and their importance in your diet and in the foods you eat.

1. Why are minerals called micronutrients?

.....

.....

.....

2. Where do the minerals in foods come from?

.....

.....

.....

3. Why do we need minerals?

.....

.....

.....

4. Do they provide energy (calories)?

.....

.....

.....

5. Are minerals destroyed by heat or air?

.....

.....

.....

6. What can happen to a person who does not get enough of the essential minerals?

.....

.....

.....



7. Deficiencies of what four minerals are most likely to cause serious health problems if we do not get enough of them from our food?

.....  
.....  
.....

8. Do you think you get enough of these essential minerals from the foods you eat?

.....  
.....  
.....

9. Do you eat a variety of different foods to be sure you get all of the minerals you need?

.....  
.....  
.....

10. How can you add more foods rich in essential minerals to your meals?

.....  
.....  
.....



★ You can look for more information on *Fact sheet Minerals,* their functions and good food sources

★ Check your answers on Answer work sheet *Minerals in my diet*



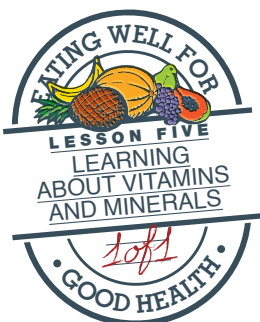
# Minerals in my diet

## Questions

1. Why are minerals called micronutrients?
2. Where do the minerals in foods come from?
3. Why do we need minerals?
4. Do they provide energy (calories)?
5. Are minerals destroyed by heat or air?
6. What can happen to a person who does not get enough of the essential minerals?
7. Deficiencies of what four minerals are most likely to cause serious health problems if we do not get enough of them from our food?
8. Do you think you get enough of the essential minerals from the foods you eat?
9. Do you eat a variety of different foods to be sure you get all of the minerals you need?
10. How can you add more foods rich in essential minerals to your meals?

## Answers

- Because they are needed in very small (micro) amounts.
- They are taken up from the soil into plants we eat.
- Minerals are needed to help the body form its structures, regulate chemical reactions and to regulate many body processes.
- No
- No
- Lack of adequate amounts of essential minerals can lead to the development of serious health problems and diseases.
- Calcium, iron, iodine and zinc
- Individual reflection
- Individual reflection
- Individual reflection



★ Use this Answer work sheet to check your answers on Work sheet Minerals in my diet



# Minerals matching game

Can you match the minerals with their functions and food sources?

- Calcium
- Iron
- Iodine
- Zinc

1. Foods rich in this mineral are red meats, liver, fish and poultry.
2. Best sources are red meat, fish and shellfish: shrimp, oysters, crabs.
3. Helps build strong bones and teeth.
4. Important for preventing mental retardation, brain damage and goitre.
5. Carries oxygen from the lungs through the body. Lack of this mineral can cause anaemia.
6. Good sources are milk, yoghurt, cheeses, small fishes with bones and leafy green vegetables.
7. Best sources are seaweed, saltwater fish, seafood and fortified salt.
8. Helps keep cells strong, assists the immune system, the central nervous system and the brain. Is involved in 100 chemical reactions in the body.



Answer key: 1 Iron; 2 Zinc; 3 Calcium; 4 Iodine; 5 Iron; 6 Calcium; 7 Iodine; 8 Zinc.

You can find more information on Fact sheet Minerals, their functions and good food sources

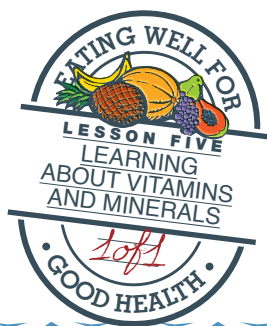
# Minerals: who am I?

How well do you know your minerals? See if you can name the correct mineral for each "Who am I?" question.

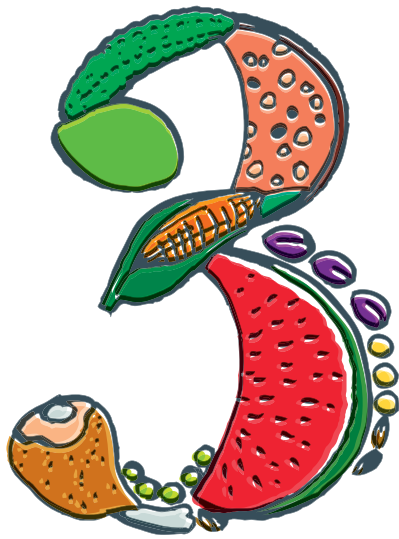
1. I help to build strong bones and I am found in dairy products and in broccoli. Who am I?  
.....
2. I help your thyroid gland to function and am very important in pregnancy for the unborn baby. I come mostly from the sea and I am added to other foods. Who am I?  
.....
3. I make the part of your blood that is red and carries oxygen through the body. I am found in many meats. Who am I?  
.....
4. I am highest during adolescence and decrease over time, especially for women as they have children. Who am I?  
.....
5. I help to heal your cuts and wounds and help your sense of taste. I am found in fish, oysters and crabs. Who am I?  
.....
6. If my levels are low, your bones can become brittle and break. Who am I?  
.....
7. I will absorb much better if you eat me together with lemons, oranges, grapefruits, tomatoes and other foods rich in vitamin C. Who am I?  
.....
8. You can find me in the soil and in the sea and in plants in many parts of the world, especially in coastal areas, but I am absent in many other places. Who am I?  
.....

★ More "Who am I" questions can be created using the Fact sheet Minerals, their functions and good food sources

Answer key: 1 Calcium; 2 Iodine; 3 Iron; 4 Calcium; 5 Zinc; 6 Calcium; 7 Iron; 8 Iodine.



# How to eat well for good health



How to eat well for good health is about how to make good food choices for a healthy balanced diet throughout life. It describes the different nutritional needs at different stages of life and discusses the importance of developing good dietary practices and eating habits. It includes practical advice on how to choose clean, fresh and nutritious foods and how to store and prepare them safely at home.



**Lesson 6**  
Meeting nutritional needs throughout life

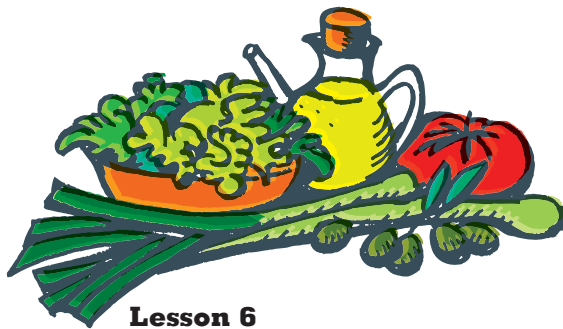


**Lesson 7**  
Making good food choices and healthy meals



**Lesson 8**  
Keeping foods safe and nutritious





### LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- understand how our nutritional needs vary with age, sex, health status and activity level;
- describe our special nutritional needs at different ages and in different stages of life;
- recognize and describe good diets for babies, children, adolescents, pregnant and breastfeeding women, in older age and during illness.

### Lesson 6

# Meeting nutritional needs throughout life

### LESSON OVERVIEW



This lesson is about our nutritional needs at different ages and in different stages of life. It shows how nutritional needs vary with age, sex, health status and activity level and highlights how important it is to meet our different food and nutrient needs in each of these life stages. It explains that people need more food if they are growing or helping others to grow (infants, children and pregnant and breastfeeding women); they need more food if they work and play hard and they may need more food if they are sick.

The lesson is divided into six separate sections describing the special nutritional needs during pregnancy and breastfeeding, the nutritional needs of babies and infants (0–24 months), children (2–10 years), adolescents (11–17 years), older people and people during illness. It suggests some good foods to eat and good eating habits that can help meet the special needs of each of the different age groups and life stages.



**Part 1**

# Nutritional needs in pregnancy and breastfeeding



## READING

All pregnant women need to eat a good, balanced diet and gain additional weight to support a healthy pregnancy and childbirth. A diet that provides the increased energy (calories) and nutrients needed during pregnancy is necessary for the health of both mother and baby. If the nutritional needs of the mother and baby are not met, the health effects can be serious. The mother's own stores of nutrients may be reduced, putting her at increased risk of illness. A baby deprived of adequate nutrition before birth is likely to have poor development in childhood and health problems throughout life.

A mother's weight gain in pregnancy directly affects the baby's development, weight and health at birth. All pregnant women need to gain some weight during pregnancy, no matter what they weigh before pregnancy. The amount of weight to gain depends on the women's height and weight when she becomes pregnant. This weight gain is needed for the proper development of the growing baby and for the added growth of the uterus, breasts and blood and other fluids and tissues needed to support the growing baby. Women at a healthy weight when they become pregnant should gain between 11.5 kg and 16.0 kg during pregnancy.

Underweight women have a greater risk of low birthweight and pre-term babies (born before 38 weeks of pregnancy). Babies with a low weight at birth (2.5 kg or less) have more health problems early in life. Severely underweight babies are more likely to die in infancy. Women who are underweight can improve their chances of having a healthy infant by gaining extra weight both before and during pregnancy. Women who are underweight at the time of pregnancy should gain between 12.5 kg to 18.0 kg during pregnancy.

Overweight and obese women are at high risk of health complications for themselves and their baby. The health complications for women who are overweight and obese when they become pregnant include high blood pressure, diabetes during pregnancy, infections at birth and complications of labour and birth. Their infants are more likely to be born post-term (born after 42 weeks of pregnancy) and to be very large. Babies who are very large at birth increase the likelihood of difficulties at birth. Babies born to obese mothers are at greater risk of heart defects and serious defects of the spine and brain. Overweight and obese women should try to be at a healthy weight before becoming pregnant; they should

### TO THINK ABOUT WHILE READING



Why are there special nutritional needs in pregnancy?

What can happen if a woman does not eat well when she is pregnant?

What is a good diet for pregnant and breastfeeding women?



avoid gaining too much weight during pregnancy but should not try to lose weight until after the baby is born. Women who are overweight or obese at the time of pregnancy should gain between 7.0 kg to 11.5kg.

A good diet during pregnancy is very important to meet the higher nutritional requirements of both the mother and baby. All nutrients need to be included in the diet during pregnancy and additional calories are needed to provide the energy required by the mother for the extra demands of pregnancy and by the baby for growth and development. Protein is especially important, as it provides the “building blocks” (amino acids) to create new tissue, such as increasing blood supply, cell and bone growth. Other nutrients that are especially important are iodine, iron, zinc, folate, vitamin A and vitamin C. Pregnant women need to eat about 280 extra calories a day.

To meet these needs for additional calories and nutrients, pregnant women should eat one or more additional servings of food either at meals or for snacks in between meals. Some suggestions as to how to meet those needs are:

- additional portions of protein foods, which include meat, fish or poultry; legumes, such as soybeans or tofu, lentils and other dried beans, nuts, such as groundnuts;
- large portions of green leafy vegetables; red or orange vegetables, such as sweet potatoes, yams, pumpkin; fruits including both citrus and other fruits;
- additional portions of milk and milk products, such as cheese and yoghurt.

Adequate iodine during pregnancy will help prevent serious birth defects, such as brain damage and mental retardation related to iodine deficiency. This need can be met through using iodized salt and eating seafoods that are rich in iodine.



See [Fact sheet on Iodine](#) in Lesson 3.

High amounts of iron are needed to prevent anaemia in both the mother and baby. Having adequate iron at this time will help reduce the risk of birth defects and deaths in pregnancy and childbirth. Additional servings of foods containing high amounts of iron, such as red meats, fish, poultry and legumes should be eaten. Women who are not able to meet their need for iron through their diet are advised, under the guidance of a doctor or other health professional, to take iron supplements during pregnancy, in addition to eating as many iron-rich foods as they can.



See [Fact sheet on Iron](#) in Lesson 3.



Very high levels of folate (a form of vitamin B) are needed to prevent severe birth defects during the first few weeks of pregnancy and to prevent anaemia in the mother and baby. The need for folate in preparation for and during pregnancy can be met by consuming at least 5 servings a day of vegetables and fruits rich in folate, especially leafy green vegetables, beans, peas and other legumes, and liver. Because of the high levels of folate needed during this time, and the severity of the birth defects resulting from lack of folate early in pregnancy, women who are not able to meet their need for folate through their diet are advised to eat foods fortified with folic acid (the synthetic form of folate) or take folic acid supplements, in addition to eating folate-rich foods. Women should consult a doctor or health professional for advice before taking supplements.



**See Lesson 5** for more information on essential vitamins and minerals and good food sources.

A good diet by the mother during breastfeeding increases the success of breastfeeding and improves the health of mother and baby. Breastfeeding requires additional nutrients and energy, as the mother needs to replace the nutrients and energy that are passed on to the baby through the milk. The nutrients that are important for a good supply of breastmilk are the same as those that are important for a healthy pregnancy. These include protein, zinc, calcium, vitamins A and C, iron and folate. Even more nutrients and an additional 450 calories every day are required to keep both mother and baby healthy during breastfeeding. Additional servings of milk and high protein snacks between meals or an additional small meal every day are good ways to meet the additional needs of breastfeeding. In addition to extra food, the mother needs to drink extra water and other liquids because of the fluid breastmilk that is provided to the baby. Insufficient food or water can decrease the amount of milk the mother is able to provide, putting the baby at risk.

Pregnant and breastfeeding women have such high nutritional demands that it may take two to three years after stopping breastfeeding for all of the mother's nutritional stores to be replaced. For this reason, good spacing between pregnancies can help improve the health of the mother and her future babies.








**See Lesson 4** for more information on the macronutrients, their functions and good food sources.





## MATERIALS

-  Fact sheet *Nutrition during pregnancy and breastfeeding (mother)*
-  Fact sheet *Weight gain during pregnancy*
-  Match it work sheet *Maternal health*
-  Work sheet *Good foods to eat during pregnancy*
-  Work sheet *Eating well during pregnancy*



## ACTIVITIES

### Maternal health



Take a quick matching exercise to check your understanding of a healthy diet during pregnancy and breastfeeding.

### Good foods to eat during pregnancy



What nutrients are especially important for pregnant women and unborn babies? What foods are good sources of these nutrients? Fill in the *Good foods to eat during pregnancy* work sheet with the names of locally available foods rich in these nutrients.

### Prepare a snack for a pregnant woman

List all the snacks that you think can meet the special dietary needs of pregnant women in your community.

*If working as a class*, you can divide into groups to prepare some of the snacks on your lists. Invite your friends and families to taste the food and select the winner. Take pictures of every snack and create a snack recipe book for pregnant women in your community.

### Eating well during pregnancy



Read about Sara, Fatima and Elena and help these three pregnant women choose the best foods for themselves and their babies.

*If you are working as a class*, split into three groups and create a 3-day menu for the mothers-to-be. If you are working individually, choose one woman and create a 3-day menu for her.



### KEY POINTS

**Review these three key points** to remember about a healthy diet during pregnancy and breastfeeding. See if your knowledge has improved and share it with pregnant and nursing women in your family.

## A healthy diet during pregnancy and breastfeeding

- A pregnant woman must meet the nutritional needs of both the rapidly growing baby and her own body changes. Poor diets and poor nutrition during pregnancy can lead to serious health problems for both mother and baby.
- A mother's weight gain in pregnancy directly affects the baby's development, weight and health at birth. Underweight women have a greater risk of low birthweight and pre-term babies; they need to gain extra weight. Overweight and obese women are at risk of health complications for themselves and their babies; they need to gain less weight but should not try to lose weight in pregnancy.
- A good diet during pregnancy and breastfeeding should include additional calories and a variety of foods to ensure that mothers get all the nutrients they need, especially protein, iodine, zinc, vitamins A and C, and high amounts of folate and iron.



**Part 2**

## Nutritional needs of babies and infants (0–24 months)



### READING

#### Nutritional needs of babies 0–6 months

Breastmilk is the natural food for babies. It is safe, inexpensive and provides all of the nutrients babies need for the first 6 months of life. It has the very important added advantage of increasing the baby's resistance to disease, as the mother is able to pass her own immune factors for certain diseases through her milk to protect her baby. This ability of breastmilk to provide protection against many diseases is an important reason that breastmilk is so healthy for babies; during the first six months of life, babies depend on their mother's milk while their digestive and immune systems are developing and maturing. Colostrum, the first milk right after birth, is an essential food for newborn babies. It contains high levels of vitamin A and substances that protect newborns from infections and disease. Babies who are breastfed have many health advantages over babies fed other milks. Mother's milk contains the perfect amount of protein, fat, carbohydrate and other nutrients for the new baby's growth and development.

Because breastmilk is so perfect for babies, it is recommended that they be fed only breastmilk for the first six months of life and that mothers breastfeed for as long as they can. Giving only breastmilk (exclusive breastfeeding) means not giving other foods or liquids to the infant for the first six months after birth, with the exception of vitamin and mineral supplements or medicines. Giving the baby other foods, liquids or water too early can introduce bacteria and increase the risk of infections and illness. Babies who are breastfed exclusively for the first six months and who continue partial breastfeeding for up to two years have lower rates of illness and death.

Mothers who cannot breastfeed should consult a health care professional to plan appropriate replacement milk. Giving cow, goat or any other animal milk to a baby under one year of age is not an adequate replacement for breastmilk, as the nutrients in those milks are those needed to support the growth of a baby cow or goat and are different from the nutrients needed by a human baby. Infant formulas available commercially can be a breastmilk substitute when necessary, but formula does not provide protection to the baby's immune system. Formula is usually expensive and requires clean water and sanitary conditions for proper preparation, cleaning of bottles and feeding.

#### TO THINK ABOUT WHILE READING



What is the best food for babies from birth to 6 months of age?

What should babies this age eat if breastmilk is not available?

What foods do babies 6–24 months need?



While breastmilk is the very best food for most infants, when the mother is HIV-positive or taking certain drugs, breastfeeding may not be recommended. Both the HIV virus and most drugs enter into breastmilk and therefore get into the baby's system. HIV can be transmitted from an infected mother during pregnancy, birth and breastfeeding. To reduce the risk of the baby becoming infected with HIV, infected mothers who breastfeed their babies are advised to take a course of antiretroviral drugs throughout the breastfeeding period. Pregnant HIV women who take antiretroviral drugs through their pregnancy and breastfeeding can greatly reduce the chances of their baby being infected with HIV. When antiretroviral drugs are not available or are not taken, replacement (formula) feeding is advised if the formula is nutritionally adequate, affordable and safe (made with clean water and utensils). When formula feeding is not possible, exclusive breastfeeding for the first six months is still recommended. Mothers should be tested for HIV before or during pregnancy and all HIV-pregnant women and mothers should consult a health care worker or doctor to discuss the risks and benefits of the different ways to feed their babies.

### Nutritional needs of children 6–24 months (2 years)

Breastmilk is the basic food of the young baby, but as the baby grows older, milk alone is not enough to meet increased nutritional needs. Because young children continue to grow very fast and may still have immature digestive and immune systems, continued breastfeeding is recommended until they are 18 months to two years of age, in addition to other foods. By six months, babies need to start to eat other foods, called “complementary foods” because they complement the breastmilk, to meet their needs for energy, protein, vitamins and minerals. Babies and young children 6–24 months old have very high energy and nutrient needs for their body size and are often at risk of being malnourished. Adequate care and feeding is essential for their normal growth, development, health and activity.

Frequent feeding (4–5 times a day) with appropriate foods, in addition to breastmilk, ensures that young children get sufficient energy and nutrients to grow normally and stay healthy. In the first 12 months of life a baby will triple its weight and increase its length by 50 per cent. Additional calories, protein and iron are especially important to meet the demands of the baby's rapid growth, in addition to other vitamins and minerals. Foods for children this age require special preparation to make sure that the foods are clean, soft and easy to eat and digest, as well as nutritious. To meet all of the baby's nutritional needs, foods high in energy and other nutrients, such as oil, fruit, vegetables, legumes and animal products, should be included in the baby's diet. When the baby is accustomed to liquid and soft foods, and as teeth appear, semi-solid and then solid foods can gradually be added to their diet.



New foods should be introduced to the child one at a time, allowing the child to get used to the food before another new food is introduced to their diet. Good first complementary foods include soft meat, vegetables and fruits, mashed or puréed to a thin consistency to prevent the baby from choking. Foods should be prepared without added salt, as babies cannot yet process salt in their systems. Starchy foods alone are not the best first foods for babies because they do not provide enough protein, calories and other nutrients to meet the needs of the rapidly growing baby. Babies who are fed too much starchy food that replaces more nourishing foods or breastmilk can become malnourished, ill, and stop growing properly. Starchy staple foods that are part of the local diet can be enriched to make good complementary foods by adding groundnuts, beans, shredded or pounded green leafy vegetables and other vegetables, fatty foods (groundnuts, meat or fatty fish) and a small amount of oil.



### MATERIALS



Fact sheet *Breastfeeding babies (0–6 months)*



Work sheet *Personal childhood timeline*



Into the field work sheet *Community interview*



### ACTIVITIES

#### Breastfed is best fed

Invite a specialist (a doctor, a nurse, a nutrition expert) to talk about the special health and nutritional benefits of breastmilk and the dietary needs of babies and infants from birth until the age of two years.

#### Personal childhood timeline

Talk to your mother or an older family member and try to find out as much as possible about:

1. **Your diet** – what you were fed as a baby until the age of two (breastmilk, infant formula, complementary local foods)
2. **Your health** – any illness episodes, vaccinations, first teeth, growth, weight gain.



Draw your personal childhood timeline on the Work sheet and fill it in with the facts on your feeding and health.



## Community interview



Contact three women in your family or community who have babies under one year of age and ask them for an interview about breastfeeding. You can come up with your own questions or use the ready-made questionnaire on the Into the field work sheet.

Discuss the breastfeeding realities and traditions that exist in your community. Compare them with the experts' recommendations: *Exclusive breastfeeding is recommended up to 6 months of age, with the introduction of additional, complementary foods and continued breastfeeding up to two years of age or beyond.*



### KEY POINTS

**Review three key points** to remember about a healthy diet for babies under 2 years of age. See if your knowledge has improved and share it with people who are responsible for feeding the babies in your family.

### Nutrition of babies and infants from birth to 24 months

- Breastmilk is the healthiest food for babies. It provides protection against diseases and contains the nutrients the baby needs for healthy growth and development.
- Babies should be fed only breastmilk for the first six months, and should continue breastfeeding until 18–24 months. At the age of six months, babies need to start eating other “complementary” foods in addition to breastmilk.
- Complementary foods for children this age require special preparation to make sure that the foods are clean, soft and easy to eat and digest, and should be introduced gradually. Good first foods are mashed, pounded or shredded soft meats, vegetables, legumes and fruits together with a small amount of oil.



**Part 3**

# Nutritional needs of children 2–10 years



## READING

Children have a high need for energy and nutrients but they have small stomachs and cannot eat large portions of food at one time. For this reason, they need to eat foods rich in protein and other nutrients often: at least 3 times a day, with 2-3 snacks during the day. Although the child is still growing rapidly, the rate of growth is slower than in the first 12 months of life. At the end of the third year of age, girls and boys will have achieved about 50 per cent of their adult height. Both girls and boys grow at approximately the same rate until they reach puberty and they need the same amount of food and have the same nutrient needs. Very active children of either sex may need slightly more food to meet their energy needs than less active children.

### TO THINK ABOUT WHILE READING



What are the special nutritional needs of children 2 to 10 years old?

How often do children this age need to eat?

School aged children who are hungry or have poor diets are likely to grow slowly, have little energy to study, play or do physical work; they do not concentrate or perform as well in school as they could. Because hungry children cannot learn well, they should all have three good meals each day and nutritious snacks, at school and at home, in between meals. It is important for children to have a nutritious meal before going to school, especially if they have to walk long distances to get there. A meal and nutrient-rich snacks while at school help keep up their energy. If schools do not provide meals or snacks, children should take food from home to eat at school. Whether these meals and snacks are provided by the family or by the school, it is important to include a variety of the different foods necessary for children's nutritional needs. Early food experiences may have important effects on food likes and dislikes and eating patterns in later life.



## MATERIALS



Fact sheet *Nutrition of children 6 months – 2 years*



Work sheet *Start the day right*



Work sheet *Colourful lunch bags*



## ACTIVITIES

### Start the day right

Discuss why it is important for children to have a nutritious meal before going to school.

*How can families make sure children eat a good breakfast in the morning?*

*What breakfast foods are served to children in your community?*

*Are they nutritious, quick and easy to eat in the morning?*

Prepare a sheet of paper with the word 'BREAKFAST' written in a vertical column or print out the work sheet *Start the day right*. List the foods that are good breakfast foods for children in your area and write them down next to the corresponding letter.



### Colourful lunch bags

Print out or draw a chart with five columns and the headings as shown on the Work sheet *Colourful lunch bags*. Fill in each column with nutritious and healthy foods and snacks that can be taken to school and eaten during the break. If you have younger brothers, sisters or friends, choose the foods to write in the chart together with them. Tell them that each day they should try to pack for school one item from at least three different colour groups. Remind them that they helped make the selection and will be eating foods they chose themselves!



### KEY POINTS

**Review these four key points** to remember about a healthy diet for children under ten. See if your knowledge has improved and share it with people who are responsible for preparing foods, meals and snacks for children in your family

### Nutritional needs of children 2–10 years old

- Children have high energy needs but small stomachs and need to eat at least three good meals a day with healthy snacks in between.
- Girls and boys this age need the same amount of food and have the same nutrient needs.
- Schoolchildren who are hungry cannot concentrate and learn well. Their day should start with a nutritious meal before going to school.
- It is very important to include a variety of different foods in children's meals in order to meet all of their nutritional needs.





**Part 4**

## Nutritional needs of adolescents (11–17 years old)



### READING

The period of adolescence is a time of very rapid growth and high demands for nutrients and energy. The rapid growth period starts at the age of 10 or 11 for girls and at the age of 12 or 13 for boys and continues for about 2.5 years. Adolescents need high intakes of calories, vitamins and minerals, especially iron, calcium, vitamins A, C and D. During this time, boys and girls begin to reach puberty (gaining sex characteristics to mature into men and women) and nutritional needs start to differ, although good nutrition is essential for both sexes to grow into healthy adults.

It is important for adolescents to select their foods carefully to ensure that their nutrient and calorie needs are met. Sometimes the workload of adolescent girls and boys increases, as they begin to have greater responsibilities for carrying out household tasks and additional jobs to help the family. When this is the case, their needs for energy (calories) for the additional work they are doing, along with their needs for growth, will have to be met. Some adolescents, however, become less physically active and have to meet their nutrient needs without eating more calories than they need to maintain a healthy body weight.

Adolescence is a time to reinforce good food habits and establish regular meal patterns. Dietary habits and food preferences are developed in childhood and particularly in adolescence. As they become more independent, many adolescents begin to have more meals away from the family, often resulting in poor food choices, skipped meals, increased snacking instead of regular, balanced meals and lower vitamin and mineral intake at a time when good nutrition is especially important. Adolescents also tend to follow food fads and slimming diets which do not meet all of their nutritional needs. It is important at this age to eat a variety of foods, including carbohydrates, plentiful fruits and vegetables, daily protein and dairy foods or other foods containing calcium and to avoid excess fat and sugar.

#### TO THINK ABOUT WHILE READING



What  
nutritional needs  
do adolescents  
have?

Why do  
adolescent girls  
have special  
food and nutrition  
needs?

What is  
a good diet for  
adolescent boys?



See Lesson 9 *Achieving good body size and weight* and  
Lesson 10 *Keeping fit and active*.



## Adolescent girls

Special attention should be given to adolescent girls, who need to be well-nourished for their own immediate development and for the future nutritional demands of childbearing. Adolescence is a critical time for young women, building the foundation for successful reproduction and a healthy adulthood and later life. Young women must enter adulthood with good nutritional stores to remain strong and healthy throughout their child-bearing years and into old age. Good nutrition is especially important for adolescent girls to meet future needs of pregnancy and breastfeeding.

Adolescence is also the time that the skeletal system builds its strong foundation of calcium stores. If the calcium stores in the bones are not sufficient entering into the reproductive years, bones can become weak with successive pregnancies, leading to broken bones and disability in later years (a condition called osteoporosis). Increasing calcium consumption by eating a diet rich in dairy foods and leafy green vegetables will help meet the increased needs of adolescents for calcium.

Because of the demands of growth, as well as blood loss with menstruation, the requirement for iron among adolescent girls is very high. It is important for girls to increase their consumption of iron-rich foods, such as red meats, fish, poultry and legumes, to help prevent anaemia resulting from iron deficiency. Adolescent girls who are anaemic and may not be eating a sufficient quantity of iron-rich foods to meet their needs may be advised, under the guidance of a doctor or other health professional, to take iron supplements.

Early pregnancies can be harmful to the health of girls who, themselves, are still growing. Young girls' bodies are still developing and usually are not ready to support the extra burden of pregnancy and childbirth. Special care must be taken during adolescent pregnancy to insure that the young mother receives sufficient food for her own increased needs, as well as for the needs of the unborn baby.

## Adolescent boys

Adolescent boys have different needs from adolescent girls because their bodies are maturing differently and at a different rate. A growth spurt happens for both sexes during adolescence, but typically boys' rates of growth are more rapid. Much of the adult height and muscle mass is gained during adolescence. Increased growth and activity increases the need for certain nutrients and energy. Boys may need even more calories during this period to support this growth, especially if their physical activity level increases. Protein foods, such as meat, fish, poultry, eggs, dairy products, nuts or seeds and legumes



are all foods that supply high protein needed for additional growth in height and muscle mass during adolescence. While boys do not have the very high need for iron that adolescent girls have, the tissue growth and increased blood volume for boys does increase their need for iron which can be met by increased meat and other iron-rich foods. Calcium needs are also increased because of the rapid bone growth during adolescence and additional dairy products and green leafy vegetables can help meet these needs.



**See** the Fact sheets in Lessons 4 and Lesson 5 for more information on the macro and micronutrients, their functions and good food sources.



### MATERIALS



Fact sheet *Nutrition for school-age children*



Work sheet *My food diary*



Ask yourself work sheet *How good is your diet?*



Work sheet *My meal analysis*



Work sheet *Help Andrew pack his lunch*



### ACTIVITIES

#### My food diary



Keep track of what you eat and drink for three days by filling in the work sheet *My food diary*. When you have completed it, use the questions to analyse your diet and eating habits.

#### My meal analysis



Choose one typical midday or evening meal and analyse it in more detail. Make a list of all the ingredients that make up each dish of this meal (for example, potatoes, beans, beef, spinach, herbs, spices, fats, oils), write each of them on cards and stick the cards on the Work sheet in the place where you think it belongs.

Discuss:

- Is the meal healthy and varied?
- Which different nutrients did you get from this meal?
- Does it provide a variety of fruit and vegetables?
- Are there too many foods rich in carbohydrates? protein? fats?
- Are there too few foods rich in carbohydrates? protein? fats?



## Plan a cooking contest with your friends

Ask each of your friends to cook a healthy dish at home and to bring it to your *Healthy eating* contest. The participants should present the ingredients and the nutritional value of their dishes and set them out to be judged on taste, appearance and dietary value. Award the winner with a prize (a recipe book) and have a party.

## Help Andrew pack his lunch

Teenagers are often very busy with school, sports and active social lives and are not always able to sit down for three meals a day. This student's school does not provide food for lunch, so he usually gets something high in energy and quick to eat. Go to the [Work sheet](#) and help Andrew start bringing a healthy lunch from home by planning his packed lunches for a week.



### KEY POINTS

**Review these four key points** to remember about a healthy diet for adolescents. See if your knowledge has improved and share it with adolescent friends and family members.

### Nutritional needs of adolescent boys and girls (11–17 years old)

- Adolescence is a time of very rapid growth and high demands for nutrients and energy as the body matures into adulthood.
- It is a time to reinforce good food choices and eating habits and establish regular meal patterns. It is important to choose foods rich in all the nutrients, and especially iron, calcium, vitamins A, C and D.
- Adolescent girls need to eat well for their own immediate development and for future motherhood. They especially need to eat foods rich in iron to meet their very high iron needs due to rapid growth and blood loss.
- Adolescent boys mature differently from girls and may need more calories and protein foods, such as meat, fish, poultry, eggs, dairy products, nuts and legumes.



**Part 5**

## Nutritional needs during illness



### READING

Eating well is especially important during illness to help the body recover and regain health. When people are ill, their need for certain nutrients is even greater to help them keep alive, fight infections and replace the nutrients lost through illness. Sick people often have little or no desire to eat, but eating is especially important, because of increased needs to fight infection and to replace nutrients that may be lost. During episodes of diarrhoea and vomiting, up to half the food taken in and much water can be lost. If sick people do not eat to meet their energy and nutrient needs, their body may start to use up their own body fat, muscles and other tissues; they will lose weight and become undernourished. People who are ill or recovering from illness need a diet that is appealing, particularly rich in micronutrients and protein and small, frequent meals.

Children and adults who are ill need to be encouraged to eat and drink, even if they have little desire to eat. They should be offered small amounts of a variety of foods frequently. Liquids, such as clean water (boiled, if necessary), fruit juices, coconut water, soups, broths and watery porridges are especially important to replace fluids lost in fever, diarrhoea and vomiting. Breastfed children who have diarrhoea need to be breastfed frequently. When recovering from being sick, people need to eat more to regain lost weight and they need to eat more nutrient-rich foods to replace lost vitamins and minerals.

It is especially important for people with HIV/AIDS to have well balanced diets. While good nutrition cannot cure AIDS or prevent HIV infection, it can help to maintain and improve the nutritional status of people with HIV/AIDS. Improved nutritional status will help them to remain more active, healthy and productive and improve their quality of life. In people infected with the HIV virus, the body's immune system has to work harder to fight infection and this increases the need for energy and nutrients. Other infections and fever also increase the body's demand for food and reduces the body's ability to absorb the nutrients in food. The amount of food that people with HIV eat is often affected by reduced appetite, sore mouth, nausea, vomiting, tiredness, depression and lack of money. However, it is particularly important for people with HIV to have a healthy and balanced diet in order to meet their increased protein and energy requirements and maintain their nutritional status. People who are infected with HIV have to eat more to meet these extra energy and nutrient needs, which will increase even more as the HIV/AIDS symptoms develop. Children with HIV/AIDS may need 50-100 percent more energy than non-infected children.

### TO THINK ABOUT WHILE READING



Why is it important to eat well during illness?

What kinds of foods are especially good during illness?

How can people be helped to eat well during illness?



## MATERIALS



Fact sheet *Good nutrition and HIV/AIDS*



Match it work sheet *Feeding sick people*



## ACTIVITIES

### Special needs during illness

Discuss the special nutritional needs during illness. Remember the last time that you were at home sick in bed.

- Did you feel like eating?
- Did someone encourage and help you to eat and drink?
- Were the foods you ate different from your usual diet?
- If yes, how were they different?
- What foods are especially good to eat during illness?
- What foods are more appealing to eat during illness?

### Go to the hospital

Invite a dietician from a local hospital or clinic to talk about the special nutritional needs and diets of people who are sick or recovering or go to the hospital yourself to talk to the dietician.

### Feeding sick people



Take a quick matching exercise to test your understanding of the special nutritional needs during illness.



## KEY POINTS

**Review these three key points** to remember about how to eat well during illness. See if your knowledge has improved and try to apply it to yourself when you are sick and to other family members.

### Eating well during illness

- People who are ill should eat well to help the body recover, fight infections, replace lost nutrients and regain lost weight.
- People who are ill or recovering from illness need a diet that is appealing, particularly rich in micronutrients and protein and small, frequent meals. Liquids are especially important to replace fluids lost in fever, diarrhoea and vomiting.
- Good nutrition can improve health and the quality of life of people with HIV/AIDS, helping them remain more active, healthy and productive.



**Part 6**

# Nutritional needs of older people



## READING

Good nutrition during older age can increase a person's ability to continue to be an active, healthy member of the community.

While older people tend to eat less, and may need to eat less (fewer calories) if their activity levels decrease, their vitamin and mineral needs may stay the same or even increase if the body absorbs them less efficiently. The need for vitamin D and calcium may actually increase during older age to help reduce the loss of calcium from the bones. Other nutrients, including especially protein, need to be provided in adequate amounts to promote growth and repair of tissue and protect against infection. For older people, eating foods high in fibre can help the digestive system, and maintaining adequate intake of liquids is important, as the skin loses its ability to keep in moisture and protect against dehydration. Foods should include a wide variety of grains, fruits, vegetables, legumes and milk products.

Food intake may be affected by some of the body changes that can accompany aging. Illness, loss of taste, smell and thirst sensation can reduce appetite; poor vision may make foods look different; swallowing may be difficult because of a decrease in saliva or because of decreased muscle tone; loss of teeth can make chewing difficult; stomach and intestinal disorders can lead to digestive problems. Eating may also decrease because of difficulty in purchasing, growing and preparing food, dependence on other people, giving food to other family members, and sometimes loneliness and depression. All of these factors, and any other health problems they may have, may affect the nutritional well-being of older people. Special efforts may need to be made to prepare foods that provide adequate energy, vitamins and minerals and are appealing, easy to eat and digest.

As in all of the life stages, in older age, dietary habits should match activity levels. Older people with limited food intake need to consume nutrient-dense, high energy foods. Older people who are unable to be active, or who decrease their activity, are at risk of becoming overweight if their food intake

### TO THINK ABOUT WHILE READING



What are the food and nutritional needs in older age?

What are good dietary habits in older age?



remains unchanged. Less active older adults need to meet their nutrient needs, while eating fewer high energy-containing foods. Those who continue to be very active need to eat adequately to maintain their ideal body weight.



### MATERIALS



Ask yourself work sheet *Keeping healthy in older age*



Answer work sheet *Keeping healthy in older age*



### ACTIVITIES

## Helping older people eat well



Read about Grandma Susan, Grandma Ana and Grandpa Jacob on the Ask yourself work sheet *Keeping healthy in older age*. Provide some good general nutrition advice and recommendations for them. If you are working as a class, you can split into three groups. Use the Answer work sheet to check your advice.



## Helping an elderly friend

### *Group activity*

Your elderly friend seems depressed, doesn't go out, and seems to be losing weight. What questions would you ask her to understand her health and nutritional status and determine if she needs additional help and support? Divide into pairs and role-play the situation. You can come up with your own questions or use the following questions:

- Are you eating enough?
- How many meals a day do you eat?
- How much milk, eggs or meat (protein foods) do you eat a day?
- How many fruits and vegetables do you eat a day?
- Why aren't you eating more?
- Are you having difficulty chewing foods?
- How are you getting your food shopping done?
- Can you participate in any food delivery programmes?
- Is there anybody who can help you cook and do some housework?



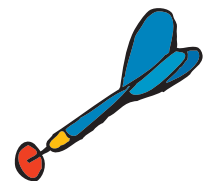


### KEY POINTS

**Review these three key points** to remember about a healthy diet for the elderly. See if your knowledge has improved and try to apply it to elderly people you know.

### Nutrition during older age

- Good nutrition during older age can increase a person's ability to continue to be an active, healthy member of the family and community.
- The vitamin and mineral needs during older age may stay the same or even increase, especially for vitamin D and calcium. A good diet for older people should provide all the necessary nutrients and be appealing, easy to eat and digest.
- The food intake of older people should match their activity levels. Less active older people should eat less high-energy food to avoid becoming overweight and those who are more active need to eat well to maintain a healthy body weight.



# Nutrition during pregnancy and breastfeeding (mother)

**Good eating habits** and proper nutrition before and during pregnancy help keep a woman healthy and allow the baby to grow and develop properly. Women's needs for energy and most nutrients increase during pregnancy and breastfeeding, so they need to have a healthy, balanced diet that meets these needs.

## Nutrition before pregnancy

Good eating habits before pregnancy are important. The health of a woman affects her ability to get pregnant, as well as the health of the unborn baby.

A woman who wants to have a baby should be in good health and have a healthy body weight. The risk of pregnancy complications is higher for women who are too thin or too heavy.

High levels of folate are needed during pregnancy, especially in the early stages, for a healthy baby. Lack of sufficient folate early in pregnancy can lead to severe birth defects in the baby. It is recommended that all women who could become pregnant eat at least 5 servings a day of vegetables and fruits rich in folate, especially leafy green vegetables, bean, peas and other legumes, and liver. Women who are not able to meet their need for folate through their diet during this time are advised to eat foods fortified with folic acid or take folic acid supplements, in addition to eating folate-rich foods. A doctor or health professional should always be consulted for advice about vitamin and mineral supplements before or during pregnancy.

## Nutrition during pregnancy

All pregnant women need to eat a good, balanced diet and gain additional weight to support a healthy pregnancy and childbirth. A diet that provides the increased energy (calories) and nutrients needed during pregnancy is necessary for the health of both mother and baby.

During pregnancy, the mother's own stores of nutrients may be reduced, putting her at increased risk of illness. A baby deprived of adequate nutrition before birth is likely to have poor development in childhood and health problems throughout life.



Pregnant women need to eat enough to supply the extra energy, protein, vitamins and minerals needed by the growing foetus (baby). However, it is not necessary to “eat for two” during pregnancy. A woman entering pregnancy with a healthy weight generally needs to eat about 280 extra calories a day.

**Protein** is especially important to create new tissues, blood, cells and bones.

**Iron** requirements are particularly high and supplements are often needed.

**Iodine** during pregnancy helps prevent serious birth defects, such as brain damage and mental retardation.

**Folate** is needed to prevent severe birth defects during the first few weeks of pregnancy.

Other nutrients that are important are **zinc, vitamins A and C**.

### Daily meals

A pregnant woman should have the following foods every day:

- 4 glasses of milk or milk products
- 3 portions of meat, fish, eggs, beans
- 4 portions of fruit and vegetables
- 6 portions of bread and cereals
- Lots of liquid .

Women should avoid drinking alcohol and should have regular medical checks throughout their pregnancy.

### Nutrition during breastfeeding

Breastfeeding requires additional nutrients and energy, as the mother needs to replace the nutrients and energy that are passed on to the baby through the milk. If the mother does not satisfy the needs of her baby, the baby will draw on, and reduce, the mother's own stores of nutrients. This puts the mother at risk of illness and can affect the baby's development.

The nutrients that are important for a good supply of breastmilk are the same as those that are important for a healthy pregnancy. These include protein, zinc, calcium, vitamins A and C, iron and folate. Additional servings of milk and high protein snacks between meals or an additional small meal every day are good ways to meet the additional needs of breastfeeding. A breastfeeding woman needs a varied and nutritious diet with staple foods, vegetables, legumes, meat and fish, and plenty of fruits. She should also drink plenty of water, milk and other fluids.

It may take two to three years after stopping breastfeeding for all of the mother's nutritional stores to be replaced, therefore good spacing between pregnancies is recommended for the health of the mother and her future babies.



# Weight gain during pregnancy

**All pregnant women** need to gain weight during pregnancy, no matter what they weigh before pregnancy. This weight gain is needed for the proper development of the growing baby and for the added growth of the uterus, breasts, blood and other fluids and tissues needed to support the growing baby.

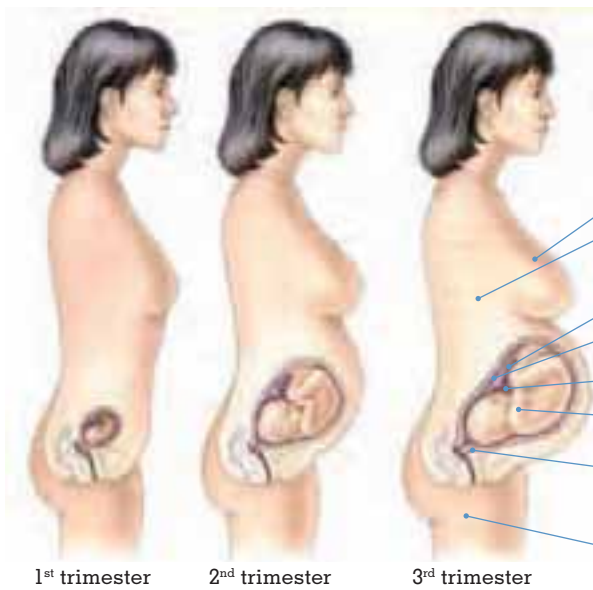
**Women at a healthy weight** should gain between 11.5 kg and 16 kg. (25–35 lbs.)

**Women who are underweight** should gain between 12.5 kg and 18 kg. (27–40 lbs.)

**Women who are overweight** should gain between 7 kg and 11.5 kg (15-25 lbs.)

**Women who are obese** should gain between 5 kg and 9 kg (11-20 lbs.)

## Where does the weight go?



## Weight Gain

	lbs.	kg
■ Increase in breast size	2	0.9
■ Increase in fluid volume	4	1.8
■ Placenta	1.5	0.7
■ Increase in blood supply to the placenta	4	1.8
■ Amniotic fluid	2	0.9
■ Baby at birth	7.5	3.4
■ Increase in size of uterus and supporting muscles	2	0.9
■ Mother's fat stores	7	3.1
	<b>30</b>	<b>13.5</b>



# Maternal health

**Do you know some important facts about pregnancy? See if you can correctly match the beginning of each sentence on the left with its correct ending on the right.**

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. All pregnant women need to...</li> <li>2. The weight gain during pregnancy is needed for...</li> <li>3. Pregnant women who have a healthy weight should gain...</li> <li>4. Pregnant women who are underweight should gain...</li> <li>5. Pregnant women who are obese should gain...</li> <li>6. Pregnant women need to eat...</li> <li>7. Breastfeeding mothers require...</li> <li>8. Low birthweight babies are those who weigh...</li> <li>9. Babies born to underweight or obese mothers are...</li> <li>10. Nearly 70,000 girls and young women die every year because...</li> <li>11. One woman dies every minute...</li> <li>12. Women who have finished secondary school...</li> </ol> | <ol style="list-style-type: none"> <li>A. less than 2.5 kg at birth.</li> <li>B. between 7 and 11.5 kg.</li> <li>C. at greater risk of health problems.</li> <li>D. between 12.5 and 18 kg.</li> <li>E. gain weight during pregnancy.</li> <li>F. have higher chances of surviving childbirth.</li> <li>G. the development of the baby and for the growth of uterus, breasts, tissues and fluids.</li> <li>H. an additional 450 calories a day.</li> <li>I. between 11.5 and 16 kg.</li> <li>J. their bodies are not ready for motherhood.</li> <li>K. from pregnancy and childbirth complications.</li> <li>L. about 280 extra calories a day.</li> </ol> |
|--|--|



**Answer key:** 1E, 2G, 3I, 4D, 5B, 6C, 7J, 8A, 9C, 10J, 11K, 12F.

# Good foods to eat during pregnancy

**Do you know which nutrients are especially important for pregnant women and unborn babies?**

**Fill in the work sheet with the names of locally available foods and traditional dishes that are rich in each nutrient.**

**Nutrients**

**Good food sources**

Protein

.....

.....

.....

.....

Iron

.....

.....

.....

.....

Iodine

.....

.....

.....

.....

Zinc

.....

.....

.....

.....

*Continued*



Nutrients	Good food sources
Folate	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
Vitamin A	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
Vitamin C	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

★ **Look for more information on food sources in these fact sheets: Vitamins, their Functions and Good Food Sources and Minerals, their Functions and Good Food Sources**

★ **See Fact sheet Nutrition during pregnancy and breastfeeding** for more information on good nutrition, eating habits and weight gain before and during pregnancy.





# Eating well during pregnancy

Read about Sara, Fatima and Elena and help them choose the best foods for themselves and their babies.

**Sara** is normal weight and expecting her first child. She is 5-weeks pregnant and her blood report shows that she has a low level of iron. What would be a good diet for Sara? What food in particular does she need to eat more often? Can she get everything she needs from food?

---

---

---

---

---

---

---

---

**Fatima** is 2-months pregnant. She is overweight. What would be a good diet for Fatima?

---

---

---

---

---

---

---

---

**Elena** is 10-weeks pregnant and lives in a mountainous area where the soil is poor in iodine. She is very thin. What would be a good diet for Elena? What food in particular does she need to eat more often? Can she get everything she needs from food?

---

---

---

---

---

---

---

---





# Breastfeeding babies (0-6 months)

## Breastmilk:

- contains all the nutrients needed for the baby to grow and develop properly.
- provides the baby with protection against certain diseases.
- is safe and comes prepared and at the right temperature.
- is free and does not require bottles and expensive formula.

## Colostrum (first milk) is important for newborn babies

The newborn baby should be breastfed as soon as possible after birth (within 30 minutes) because:

- The first milk that comes right after birth for 2-3 days, called colostrum, helps protect newborns from infections and disease and is rich in Vitamin A.
- It encourages the baby to suck, which stimulates the flow and production of breastmilk.
- Breastfeeding right after birth is also good for the mother. It helps the uterus to shrink and to stop bleeding after birth.

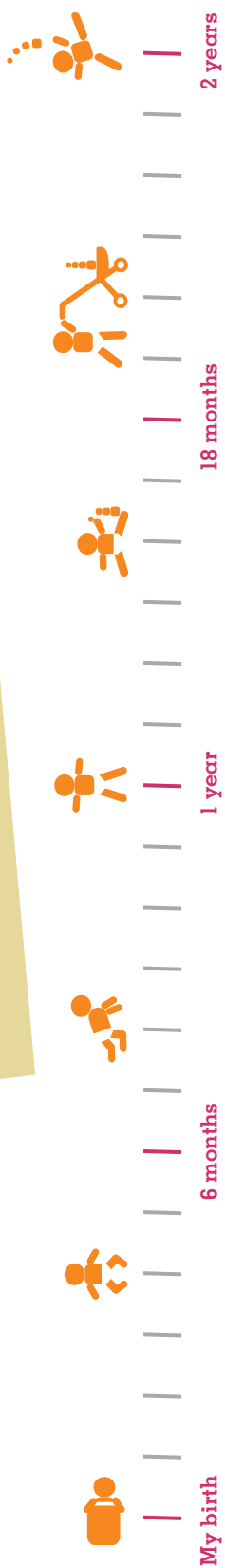
## Breastmilk is ideal for babies

- Babies should be given only breastmilk from birth to 6 months of age. A baby's stomach is too small and weak to digest solid foods in the first 6 months. Giving the baby other foods, liquids or water too early can introduce bacteria and increase the risk of infections and illness.
- Babies who are breastfed exclusively for the first six months and who continue partial breastfeeding for up to two years have lower rates of illness and death.
- If the baby is fed often, or the milk is expressed for feeding, this meets the baby's needs and will help make sure that the mother has a good supply of milk.
- Expressed breastmilk can be stored in a clean container in the fridge or in a sufficiently cool place for 24 hours.



# Personal childhood timeline

**How much do you know about your diet and health as a child?**  
**Talk to your mother** or other people in your family to learn about what you ate and how healthy you were during the first two years of your life.  
**Get as much information as you can**, including illnesses, vaccinations growth and weight gain, and record your findings on the work sheet.



<p><b>My diet</b></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p><b>My health</b></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

★ See Fact sheet **Nutrition of children 6 months to 2 years** for more information on healthy first foods and feeding practices.



# Community interview

**Identify three women in your family or community who have babies under one year old to interview about breastfeeding. Record each interview separately, using this questionnaire or your own questions. Compare your findings to the experts' recommendations.**

1. Are you breastfeeding your baby? Yes  No
2. If no, what replacement are you giving the baby?  
.....  
.....
3. When did you stop breastfeeding? Age in months  Never breastfed
4. How often do you feed the baby?  
.....  
.....
5. Do you give only breastmilk to the baby? Yes  No
6. If no, what else do you give the baby?  
.....  
.....
7. When did you start to give the baby other liquids or foods?  
.....  
.....
8. How do you prepare the additional foods you give the baby?  
.....  
.....
9. What do you eat to meet your baby's and your own nutritional needs?  
.....  
.....
10. Do you think your baby is growing and developing well? Yes  No   
Why?  
.....  
.....
11. Do you have your baby weighed regularly to check weight gain? Yes  No   
If no, why?  
.....  
.....



# Nutrition of children 6 months – 2 years

## Feeding young children frequently

with appropriate foods, in addition to breastmilk, will help ensure that they get the energy and nutrients they need to grow normally and stay healthy.

### Introducing first foods

As the baby grows older, breastmilk is still very important but it is not enough on its own to meet the nutritional needs of older babies. Babies and young children 6-24 months old have very high energy and nutrient needs for their body size and are often at risk of being malnourished. Breastfeeding should continue even until the age of 2, if possible, while the baby starts to eat other foods.

- At about 6 months, the baby should be introduced gradually to other foods that supplement breastmilk. Feeding of solid foods should start with one small meal a day and increase to 2 or 3 meals a day by the age of 7 months. Different foods are usually introduced one at a time to give the baby a chance to get used to eating and digesting that food.
- By the age of one year, if a child is breastfed, it should have 3 meals a day, and nutritious snacks in between meals. If the child is not breastfed, it should be fed 5 meals a day.
- By the age of one year most children can eat finely mashed family meals and snacks. Meals should be increased to 5 a day. If the child is not breastfed, give two extra small meals.

### Healthy first foods

- Starchy foods alone are not the best first foods for babies because they do not provide enough protein, calories and other nutrients to meet the needs of the rapidly growing baby. Foods from all food groups – meats, dairy, fruits, vegetables, breads, grains, cereals – should be included in the baby's diet. Starchy staple foods that are part of the local diet can be enriched to make good first foods by adding small amounts of shredded, chopped or pounded foods from other food groups and a small amount of oil.
- Babies' first foods require special preparation to make sure they are clean, soft and easy to eat and digest. They should be mashed and diluted to prevent



choking. When the baby is accustomed to liquid and soft foods, and as teeth appear, semi-solid and then solid foods can be added to the diet. Foods should be prepared without added salt, as babies cannot yet process it.

- Some examples of good first foods are:
  - Porridge or cereal with milk, fruit juice, a little oil, fat or butter, finely chopped nuts or sugar
  - Mashed yellow and green vegetables and yellow fruits (spinach, potatoes, yams, carrots, papayas, pumpkin, cooked breadfruit, maize, bananas, mangoes, guavas)
  - Mashed vegetables with a little soup, sauce or gravy from meat dishes
  - Soft, finely chopped or shredded meat, chicken, egg yolk, fish or liver
  - Very finely chopped or mashed nuts, legumes or seeds (groundnuts, chickpeas, sunflower seeds)

### How to encourage small children to eat

Children eat more when their parents, family and others around them actively encourage them to eat. Here are some suggestions:

- Sit with children and talk to them about how good the food is.
- Feed young children with the rest of the family but give them their own plates and spoons to make sure they eat their share.
- If the child wants to hold food, give it to him and tell him not to worry about messy eating. Make sure all of it gets into the child's mouth.
- Mix foods together if the child picks out only favourite foods.
- Do not hurry children. They may eat a bit, play a bit, and then eat again.
- Feed young children frequently, as soon as they are hungry. Do not wait for them to start crying for food.
- Do not feed when children are tired or sleepy.
- Make mealtimes happy and interesting, for example, by teaching the names of foods, playing games.
- Give more attention when the child eats well and less when the child is trying to gain attention by refusing food.
- Avoid force-feeding – this increases stress and decreases appetite even more.



# Start the day right

**A good breakfast is especially important for growing children.**  
**Think of the foods in your area** that are good for children to eat in the morning.  
**Write these foods in the work sheet**, overlapping one letter of each food word with one letter of the word "Breakfast".

B  
R  
E  
A  
K  
F  
A  
S  
T

**This is an example for you!**

- BEANS
- YOGHURT
- EGGS
- APPLE JUICE
- MILK
- FRESH AND DRY FRUIT
- CEREALS
- SLICE OF CHEESE
- TOASTED BREAD WITH JAM



# Colourful lunch bags

Did you know that eating a “rainbow” of different coloured foods will help make sure that you are eating a good variety of foods?

Think of locally available foods that are nutritious and healthy and can be easily taken to school for a snack or lunch. List as many foods as you can think of for each colour.

Red foods	Orange and yellow foods	Green foods	White foods	Purple, brown, black foods
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....
• .....	• .....	• .....	• .....	• .....



★ See Fact sheet **Nutrition for school-age children** for more information.

# Nutrition of school-age children

## School-age children are growing rapidly

and have particularly high energy and nutrient needs. A varied and balanced diet is important for protecting their health and for promoting their physical and mental development. A good diet and good eating habits can help children improve their concentration and educational performance in school and can reduce some health risks such as vitamin A deficiency, anaemia and other micronutrient deficiencies. A good diet in childhood may also help to minimize illness and chronic disease later in life.

### What can happen if school-age children do not eat well?

Schoolchildren who are hungry or have poor diets usually grow more slowly than well-nourished children. They often have too little energy to play, study or learn properly. They may become ill more frequently. They are likely to have difficulty concentrating at school and may not do as well as well-fed children. As a result, their educational achievements may be poor and they may leave school early before finishing. The combination of poor education and poor health can seriously affect their ability to lead full, active, productive lives.

### What is a healthy diet for school-age children?

Both girls and boys of this age grow at approximately the same rate and need the same amount of food. A healthy diet for children five years and older should provide every day sufficient quantity and variety of foods to meet their needs for proper growth and development. Parents, teachers and other caregivers should make sure that children have plenty of foods rich in energy, protein, vitamin A, calcium, iron, iodine.

A healthy diet for children this age should have:

- plenty of fibre-rich starchy foods (such as rice, maize, cassava, bread, noodles and yams)
- plenty of different coloured vegetables (especially dark leafy greens and orange-coloured vegetables)
- plenty of different fruits (fresh or dried)
- beans, peas and small amounts of meat and fish
- some dairy products (milk, yoghurt, cheese) and eggs
- a little fat (added to other dishes)
- plenty of clean, fresh drinking water.





### How many meals should schoolchildren have?

Children this age need to have, **every day**, three meals, plus nutritious snacks in between meals.

**Breakfast** is always important, but especially so if a child has to walk a long way to school and does not eat much at midday. Schoolchildren should start every day with a nutritious meal before going to school.

An example of a good breakfast would be a starchy food, such as bread, porridge, cereals, cassava, sweet potato, with milk, yoghurt, peanut butter, cooked beans, fruit or fresh fruit juice.

**Mid-morning snacks** keep up the child's energy for play and study. Some examples of good snacks, especially when more than one food is eaten, are: fresh or dried fruits; cheese; nuts or seeds; eggs (easy to carry if hard boiled), bean cakes; rice cakes; bread with cheese, groundnut paste/peanut butter or other spreads; boiled or roasted maize cobs; boiled or fried cassava, plantain, yam, sweet potatoes and other potatoes; dried meats or small fish.

**Lunch (midday meal)** should contain a variety of foods and should provide sufficient energy. If meals are provided by the school, they should be as nutrient-rich as possible. If school meals are not provided, children will need to take food from home to eat at school.

**Mid-afternoon snacks** are important if the midday meal is not sufficient or if the child has to walk a long distance back home.




**Dinner (evening meal)** may be the biggest meal of the day for many children, so it should be a good, varied meal. It is very important to include many different foods in children's meals in order to meet all of their nutritional needs.





# My food diary

Use this work sheet to record everything you eat and drink each day for three days. List all foods that you eat at each meal and all snacks you eat in between meals.

	Day 1	Day 2	Day 3
Morning meal (breakfast) 	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....
Snack	..... ..... .....	..... ..... .....	..... ..... .....
Midday meal (lunch) 	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....
Snack	..... ..... .....	..... ..... .....	..... ..... .....
Evening meal (dinner) 	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....



# How good is your diet?

How do you rate your diet and eating habits?  
Use your completed 3-day food diary to analyse your diet.

- 1. Do you think you are eating the right amount of foods? Yes  No
- 2. Are you eating at least 3 times a day? Yes  No
- 3. Do you eat breakfast? Yes  No
- 4. Do you eat the same type of food every day? Yes  No
- 5. Do you eat a good variety of different foods? Yes  No
- 6. Do you drink enough water? Yes  No
- 7. In these three days what protein-rich foods did you eat?  
.....
- 8. What foods provided you with carbohydrates?  
.....
- 9. How many high-fat foods did you eat every day? Which ones?  
.....
- 10. How much sugar or how many sugary foods (sweets) did you eat each day?  
.....
- 11. How many portions of foods rich in vitamins and minerals did you eat?  
Which ones?  
.....
- 12. What vitamins and minerals do each of these foods contain?  
.....



How good is your diet? (cont.)

13. Are you eating fruits and vegetables every day? Yes  No

14. How many fruits and vegetables did you eat?  
.....

15. What iron-containing foods did you eat?  
.....

16. Do you think your diet provides enough iron? Yes  No

17. What calcium-containing foods did you eat?  
.....

18. Do you think your diet provides enough calcium? Yes  No

19. What iodine-containing foods did you eat?  
.....

20. Do you think your diet provides enough iodine? Yes  No

21. Are there any foods and nutrients you are low in?  
.....

22. What problems can arise if you don't eat enough of these foods?  
.....

23. What foods can you add or replace to improve your diet?  
.....  
.....

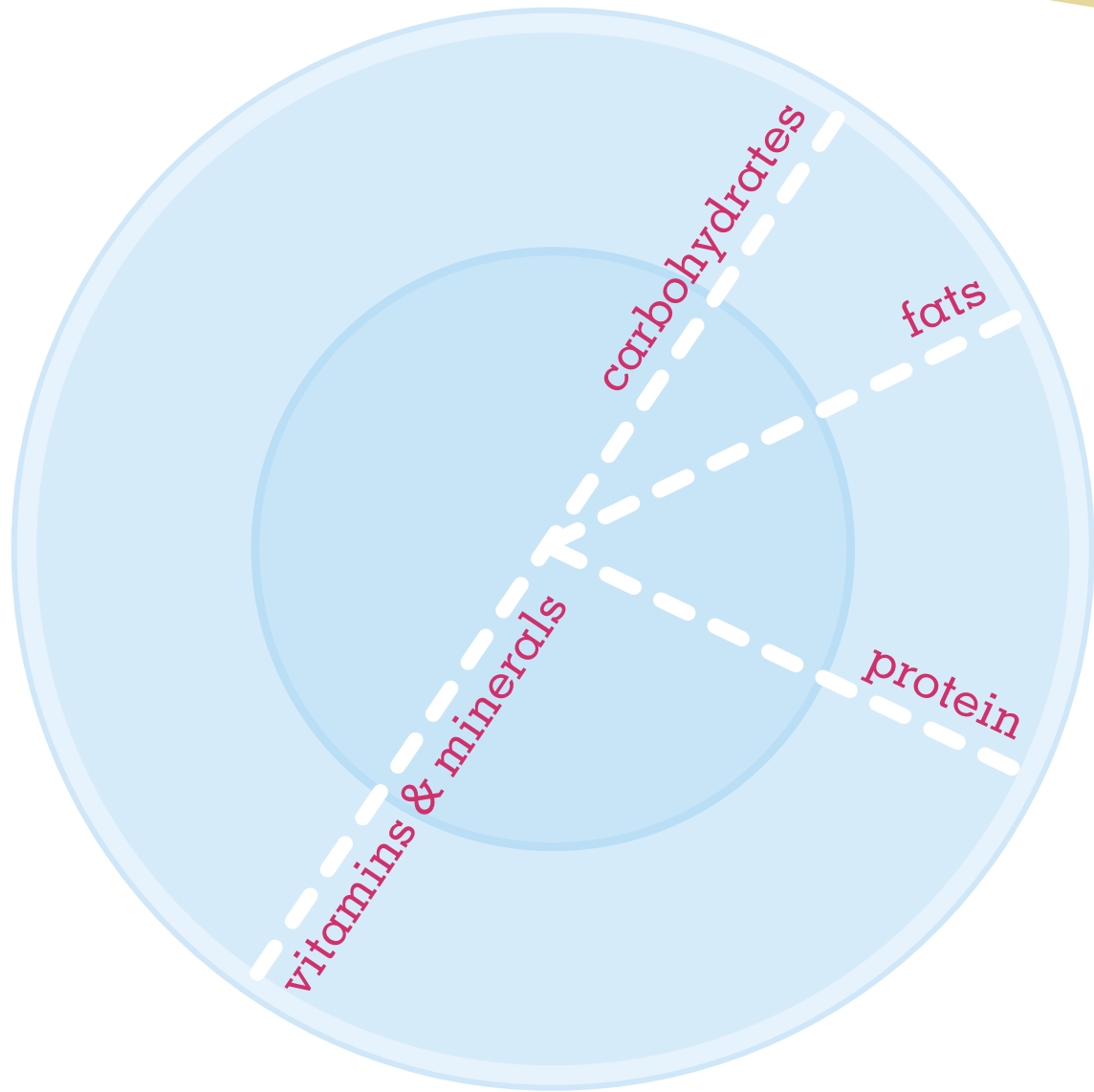


**★ You need to complete the**  
Work sheet **My food diary** before you can complete  
this work sheet.



# My meal analysis

Choose one typical midday or evening meal to analyse in detail.  
List all of the foods and all of the ingredients in each dish in the meal and write them in the correct group.



★ Is the meal healthy and varied?  
Which different nutrients did you get from this meal?  
Does it provide a variety of fruit and vegetables?  
Are there too many foods rich in carbohydrates? Protein? Fats?  
Are there too few foods rich in carbohydrates? Protein? Fats?





# Help Andrew pack his lunch

**Is Andrew eating a good lunch?**  
**Think about Andrew's nutritional needs and plan a different, healthy lunch that he can prepare at home and take to eat at school.**  
**Fill in his lunch for each day of the week.**

Andrew is 15 and has a very busy schedule and a long day.

**In the morning** he has some milk and toast for breakfast and rides his bike to school.

**At lunch time** he plays ball with his friends and usually grabs something sweet to eat quickly for energy with a soft drink.

**Three days a week** he stays late for after school activities and sports.

**The other two days** after classes end he rushes off on his bike to play drums in a band with other boys.

**He returns home** at around 6 p.m., helps with family chores, does his homework and has dinner.

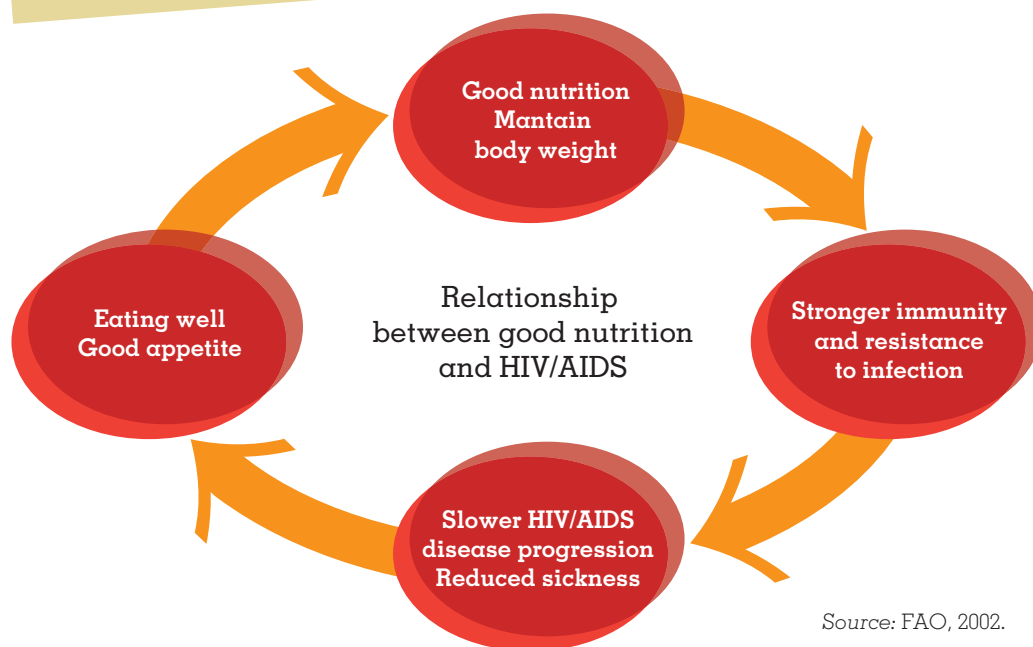
## Andrew's packed lunches

Monday	Tuesday	Wednesday	Thursday	Friday
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....



# Good nutrition and HIV/AIDS

**Good nutritional status can make a big difference in the well-being and quality of life of a person living with HIV/AIDS. Good nutrition cannot cure AIDS or prevent HIV infection, but it can help to maintain and improve the nutritional status of a person suffering from HIV/AIDS.**



## HIV/AIDS and nutrition

Poor nutrition can be a serious danger for people living with HIV/AIDS. Even at the early stages of HIV infection when very few symptoms appear, HIV makes demands on the body's nutritional status. And during the course of the HIV infection, the risk of malnutrition in the form of undernutrition and lack of micronutrients increases significantly.

The HIV virus attacks and damages the body's immune system, which increases the risk of other infections. These infections can lower food intake because they reduce appetite and interfere with the body's ability to digest and absorb food. As a result, the person becomes malnourished, loses weight and is weakened. Eating well helps to maintain and improve the performance of the immune system - the body's protection against infection - and therefore helps a person to stay healthy.

One of the possible signs of the onset of clinical AIDS is a weight loss of about 6-7 kg for an average adult. When a person is already underweight, a further weight



loss can have serious effects. A healthy and balanced diet, early treatment of infection and proper nutritional recovery after the infection can reduce this weight loss and reduce the impact of future infection.

Many of the symptoms of the conditions associated with HIV/AIDS - diarrhoea, weight loss, sore mouth and throat, nausea or vomiting - are manageable with appropriate nutrition. Good nutrition will also complement and reinforce the effect of any treatment or medicines taken.

### Healthy diet is important for people with HIV/AIDS

A person who is infected with HIV/AIDS and is not showing signs of illness does not need a specific "HIV diet". However, people infected with HIV should make every effort to adopt healthy and balanced eating habits in order to meet their increased protein and energy needs and maintain their nutritional status.

Once people with HIV/AIDS become ill, they have special needs. As the body works harder to fight against infections, energy and nutrient needs increase. Further infection and fever also increase the body's demand for food. Once people are infected with HIV they have to eat more to meet their extra energy and nutrient needs.

A healthy and balanced diet should be one of the goals of counselling and care for people at all stages of HIV infection. An effective programme of nutritional care and support will improve the quality of life of people living with HIV/AIDS by:

- maintaining body weight and strength;
- replacing lost vitamins and minerals;
- improving the function of the immune system and the body's ability to fight infection;
- extending the period from infection to the development of the AIDS disease;
- improving response to treatment; reducing time and money spent on health care;
- keeping HIV-infected people active, allowing them to take care of themselves, their family and children; and
- keeping HIV-infected people productive, able to work, grow food and contribute to the income of their families.



★ For more information on  
living well with HIV/AIDS:  
[www.fao.org/docrep/005/y4168e/y4168e00.HTM](http://www.fao.org/docrep/005/y4168e/y4168e00.HTM)



# Feeding sick people

1. A sick person should...
2. A diet for a sick person should...
3. A sick person should drink plenty of liquids...
4. People with diarrhoea, fever or vomiting should drink...
5. A sick breastfed baby should...
6. If a person has to stay in bed, water and food should...
7. A caregiver should...
8. Good nutrition cannot cure AIDS, but it can...
9. Children with HIV/AIDS may need...

**Do you know some important facts about eating during illness? See if you can correctly match the beginning of each sentence on the left with its correct ending on the right.**

- A. ...be kept nearby.
- B. ...extra liquids frequently.
- C. ...wash his/her hands before and after feeding sick people.
- D. ...50–100 percent more energy than non-infected children.
- E. ...eat well to help the body recover, fight the illness and prevents weight loss.
- F. ...such as boiled water, fruit juices, soups, broths, watery porridges.
- G. ...be breastfed more often.
- H. ...contain small, frequent meals with a variety of foods, rich in micronutrients and protein.
- I. ...help to improve the nutritional status of people with HIV/AIDS.

Answer key: 1E; 2H; 3F; 4B; 5G; 6A; 7C; 8D.

For more information on the importance of healthy diets for people with HIV/AIDS, see Fact sheet **Good nutrition and HIV/AIDS**.



# Keeping healthy in older age

Read about Grandma Susan, Grandma Ana and Grandpa Jacob.

What advice can you give them to help them be as healthy as they can be?

**Grandma Susan** maintains a healthy body weight and enjoys good health for her age. Because of this, she is able to live on her own and be active at home and in her community. She volunteers at the local public library three days a week and baby-sits some afternoons for her three small grandchildren. She enjoys walking and gardening. **What dietary or other recommendations do you have for Grandma Susan?**

.....

.....

.....

**Grandma Ana** suffers from osteoporosis and she has fallen a few times and fractured some bones. She has difficulty moving around and she is often in pain. She lives with her son and his family and spends most of her time at home, doing small activities while sitting down, like sewing and knitting, talking with her family, listening to the radio or watching TV. She enjoys eating but is worried that she is gaining too much weight. **What dietary or other recommendations do you have for Grandma Ana?**

.....

.....

.....

**Grandpa Jacob** does not suffer from any serious physical problems, but he has lost many of his teeth. He has so much difficulty chewing that it is not easy for him to find foods that he can easily eat and so he is losing interest in eating. He continues to be active with friends and family, but he is losing weight and getting thin. **What dietary or other recommendations do you have for Grandpa Jacob?**

.....

.....

.....



★ You can check your recommendations with the Answer work sheet **Keeping healthy in older age**



# Keeping healthy in older age

**Grandma Susan** is maintaining a healthy body weight so she seems to be eating the right amount of food for her activity level. **She should continue to do this, being sure to eat a variety of foods** rich in protein, calcium, iron, fibre and vitamins C and D. Her diet should include grains, fruits, vegetables, legumes and milk products. She should try to be as physically active as she can, doing the things she likes to do, such as walking, gardening and playing with her grandchildren.

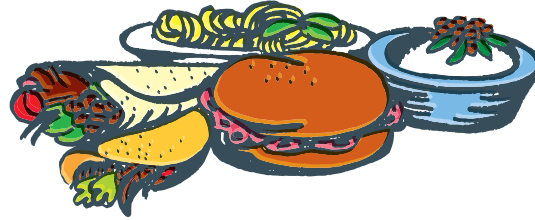
**Grandma Ana** is not very active; she is in pain and is afraid of falling again and breaking bones. Her osteoporosis is a result of a lack of calcium, which has made her bones weak and brittle. If she becomes overweight, this will add to her health problems and make it even more difficult for her to move. **She will need to try to decrease the amount of food she eats, but make sure she gets enough calcium-rich foods:** milk, yoghurt, cheese, leafy greens, small fish (with bones). She should be helped and encouraged to move a little bit every day, doing simple activities and light household chores, and to get some sunshine for vitamin D.

**Grandpa Jacob** is not eating enough to maintain a healthy body weight. **He needs to increase the amount of food he eats or** he will be at risk of becoming too thin, which will make it difficult for him to be healthy and active. **He needs to choose soft foods and recipes that are rich in macro- and micronutrients** and do not require much chewing, such as: yoghurt, soft cheeses and milk; meat and vegetable broths and soups; cooked and mashed vegetables; fish; cooked and mashed fruits; fruit juices.

★ Use this Answer work sheet to check your advice and recommendations on Work sheet *Keeping healthy in older age*







### LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- discuss some of the reasons why people eat what they eat;
- understand the reasons behind your own personal food choices;
- select nutritious foods and plan a healthful diet.

### Lesson 7

# Making good food choices and healthy meals

### LESSON OVERVIEW



This lesson is about the careful food choices we need to make to have a healthy, balanced diet. It explores the different reasons we eat what we eat, such as our eating habits, traditions, cost, taste and many others. It highlights the importance of selecting foods according to their nutritional value and our body's needs. The lesson explains how a healthy diet should be balanced and composed of a variety of foods that supply all the nutrients we need. Some examples of dietary guidelines from around the world are provided and learners are encouraged to develop their personal guidelines based on their health and dietary needs.



## Part 1

# Eating habits and healthy diets



### READING

We need to eat to meet our nutritional needs, but people often make their food choices for reasons other than nutrition. The availability of foods and their cost; the taste and appearance of foods; personal food likes and dislikes; convenience; religious and cultural practices and traditions; health and medical conditions; and knowledge about foods and the body's nutritional requirements, all are reasons why people eat the foods that they eat.

Eating habits and traditions are different for every culture. Some cultures eat their main meal in the morning before the work day; for others the main meal is in the middle of the day. Still other cultures eat their main meal at the end of the day. Some societies eat twice a day; others eat three times a day. In some cultures, families eat together, in others adults eat separately from children, or men eat separately from women.

Many cultures and societies have rules or beliefs about specific foods that are not to be eaten ("food taboos"). Some of these apply to the entire population and some apply only to people in certain conditions, such as during pregnancy, breastfeeding, infancy or illness. While many of these practices may contribute to good health, some of them may actually be harmful, as they deprive people of needed nutrients. When foods of important nutritional value are avoided or forbidden for cultural reasons or beliefs, these foods need to be replaced by other, more culturally acceptable foods of similar nutrient content.

No single food contains all of the nutrients we need to be healthy. That is why we need to eat a variety of foods in sufficient amounts. A good diet will include many different foods, preferably consumed over the course of the day, and will be sufficient in quantity and quality to meet an individual's need for food energy (calories) and other nutrients. Without adequate variety in the diet, it is possible to consume the calories we need or more calories than we need and yet still not meet our body's needs for all nutrients or for a particular nutrient. We need to choose foods for meals and snacks that are high in nutrients but that meet the body's need for energy (not too little, not too much). The goal of a good diet is to meet all our energy and other nutrient needs while keeping within our dietary

#### TO THINK ABOUT WHILE READING



Are you choosing the right foods to eat?

Are you getting what you need from your food?

Do you keep in mind your body's needs when you decide what to eat?

Are there any dietary guidelines in your country that can help you understand which foods to eat more often or less often?



calorie intake needs. Doing so can help lead to normal growth and development in children, better health for people of all ages and decreased risk of a number of chronic diseases that can be major health problems.

There is no one “ideal” diet that is right for everyone. Nutritional needs are specific to each individual, but everyone needs a diet that is balanced and includes a variety of foods that supply the different kinds and amounts of nutrients they need for good health. Balance and variety in the diet means ensuring that we get enough, but not too much, of the energy and nutrients we need. It also means that we avoid excessive amounts of any one food or any food component (nutrient). With careful food selection, we can obtain all the nutrients we need, while enjoying a variety of foods, and still maintain a healthy body weight.

Ideally, a balanced meal is achieved at every mealtime or eating occasion. Balance and variety can also be achieved in combination (meals and snacks combined) and over time (different meals in the course of the day or week). For example, a food or nutrient that may be lacking or in excess in one meal can be made up for or balanced in the next meal or snack. Eating more food (calories) than we need one day, or less than we need, can be balanced by how much or how little we eat the following day. In order to maintain balance and variety, we must understand our nutrient needs and which foods provide them and we should keep this in mind when making our food choices.



**For more information** on the nutrients in foods, see [Lesson 4 Learning about carbohydrates, protein and fats](#) and [Lesson 5 Learning about Vitamins and Minerals](#).

A healthy, balanced diet can be based on local eating patterns, using locally available foods and respecting local eating customs. The foods in people’s diets around the world are very different from each other, but all good diets must be composed of a variety of different foods that provide all of the food energy and other nutrients in the amounts needed. For most people, a good meal will be based on a starchy carbohydrate food, sometimes referred to as “staple” foods, as they form the basis or main portion of the meal, and a variety of other foods (side dishes) that provide the additional protein, vitamins and minerals needed for a good, healthy diet.

Staple foods are usually starchy carbohydrates such as rice, pasta, breads, couscous, and other foods made from wheat, rice, millet, rye, barley and oats, cassava, maize (corn) or potatoes. These foods contain energy-rich carbohydrates, and in their unrefined form, also contain B vitamins, fibre, smaller amounts of other vitamins, minerals and even a small amount of protein. The kind of starchy foods eaten should be varied as much as possible.

The other foods eaten with the meal should include a wide variety of different kinds of foods, in appropriate amounts, that meet our food energy and



nutrient needs. These should include: generous amounts of vegetables and fruits; good amounts of legumes; smaller amounts of meat, poultry, eggs or fish and milk and milk products, such as cheese and yoghurt. These foods can be prepared in the form of stews, soups, sauces, relishes, toppings or single food servings to accompany the main staple food of the meal. The greater the variety of side dishes served with the staple food, the greater the chance that all the needed nutrients are included in the meal.

While individual nutritional and dietary needs vary with age, sex, health status and activity levels, most general dietary advice for adults recommends:

- **Eating starchy carbohydrates as the basis of most meals.** The starchy carbohydrates – grains, breads, cereals, potatoes - should provide the body's main source of energy from food. These foods also provide some protein, some micronutrients and fibre. Whole unrefined grains and foods made from unrefined grains are especially good; they are a source of nutrients such as iron, magnesium, selenium, B vitamins and fibre. Examples of unrefined grains are: bulgur, millet, oatmeal, quinoa, rolled oats, whole-grain barley, whole rye, whole wheat, and buckwheat. Eating whole grains as a single food (such as brown rice and oatmeal) or as an ingredient in foods may reduce the risk of certain heart diseases.
- **Eating fruits and vegetables as much as possible every day.** Fruits and vegetables are a major source of dietary fibre and essential vitamins and minerals, including folate, magnesium, potassium and vitamins A, C, and K. Including a wide variety of different colours and types of fruits and vegetables is important for providing a variety of the necessary vitamins and minerals in the diet. Eating adequate amounts of fruits and vegetables may help reduce the risk of certain chronic diseases and may help protect against certain types of cancers. Most vegetables are low in calories and fat.
- **Eating legumes regularly.** Legumes, such as dried beans, peas and lentils, are a good source of protein and other important nutrients such as iron, zinc, potassium and folate and dietary fibre. Legumes are low in fat.
- **Eating milk and milk products regularly in small amounts.** Milk, cheeses, yoghurt and other milk products provide protein, fat and many other important nutrients, especially calcium and potassium. People who may need to reduce their fat and calorie intake can select lower-fat varieties which still provide other important nutrients.
- **Eating meat, poultry, eggs and fish regularly in small amounts.** These foods provide protein, fat and other important nutrients, such as iron, the B vitamins and zinc. Eating even small amounts of these foods on a regular basis can help meet the need for protein. Leaner meats or meats with reduced fat can still provide protein and other nutrients, while reducing the amount of fat and calories. Certain fatty fishes, such as salmon, mackerel, herring, trout, sardines, swordfish and tuna, contain essential fatty acids that help reduce the risk of heart disease and have other health benefits.
- **Choosing carefully the types of fats and oils in the diet and using limited amounts.** Fats and oils are high in energy and are important for absorbing





vitamins A, D, E and K. Red palm oil is rich in vitamin A. Fats can be an important source of dietary energy for people with inadequate total energy intake. People who need to reduce their energy intake may need to limit the amount of fat in their diet. Because not all fats are the same, it is important to choose carefully the type of fat, as well as the amount, consumed. Most of the fat in the diet should come from unsaturated fatty acids, especially oils, seeds, nuts and fatty fish that provide omega-3 fatty acids. The amount of saturated fats in the diet should be limited and trans fats and foods containing trans fats (partially hydrogenated oils) should be avoided or eaten as little as possible.

- **Limiting consumption of sugar, sugary foods and beverages.** These foods provide food energy, but few other nutrients; they often have a high fat content. Because they provide additional calories and few essential nutrients, they should be consumed only when nutrient needs have been met and without going beyond daily calorie needs for maintaining a healthy body weight.
- **Consumption of salt.** Salt contains sodium, an essential mineral that helps the body perform many important functions, especially regulating the body's fluid volume. Recent research indicates that the body has mechanisms to ensure sufficient sodium availability for these essential functions. Consuming high amounts of sodium can contribute to high blood pressure (hypertension), a major risk factor for heart disease, stroke and kidney disease, but too low sodium intake can also have very harmful effects. People who are salt-sensitive or who are at-risk of hypertension should limit the amount of salt they consume. Most people can consume moderate amounts of salt in their food.
- **Limiting consumption of alcohol.** Alcohol provides food energy, but does not provide other nutrients. Limiting the amount of alcohol in the diet can help to control the number of calories consumed. Moderate consumption of alcohol may lower the risk of heart disease, but high consumption, over time, can lead to a number of health problems. Alcohol during pregnancy can lead to serious problems in the development of the unborn baby and should be avoided.
- **Maintaining energy balance to keep a healthy body weight.** To be in energy balance and maintain a healthy body weight, the calories consumed from foods must be balanced by the calories used in normal body functions, daily activities and physical activity. Using more energy than is taken in from food can lead, over time, to weight loss and, in some cases, to undernourishment. Taking in more food energy than is used can lead, over time, to weight gain. The best way to maintain a healthy body weight is to balance the amount of calories taken from food with the amount of energy used.



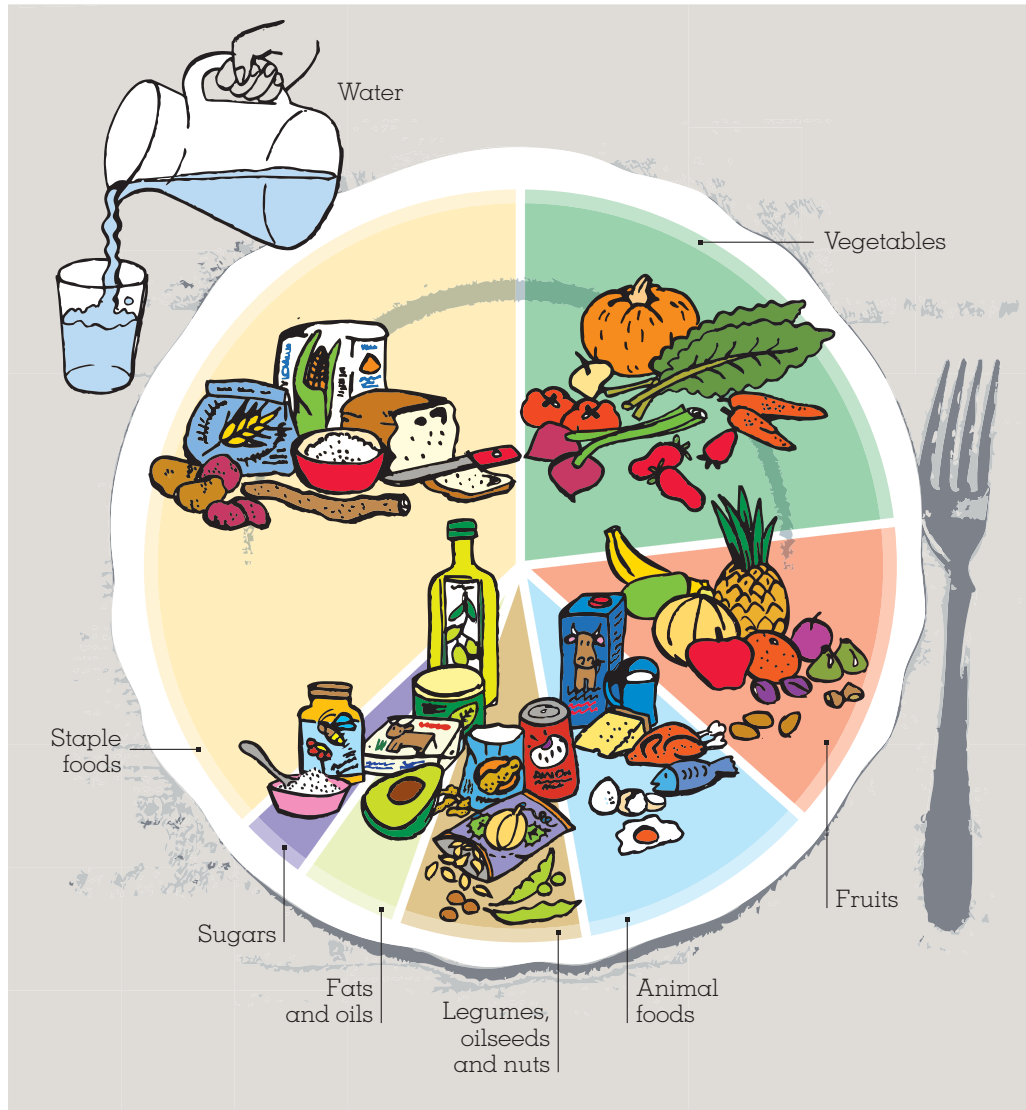
**For more information** on energy balance, see [Lesson 9](#)  
*Achieving healthy body size and weight.*



- **Drink plenty of water every day.** Water is more important to life than any other nutrient and the body needs more water every day than any other nutrient. The body's water supply needs to be refilled every day.



**For more information** on nutritional needs at different stages of life, see [Lesson 6 Meeting nutritional needs throughout life](#).



Snack foods eaten in addition to regular meals have an important place in a good diet. Snacks are recommended for people with high needs for food energy and nutrients and for people who may not be able to eat enough food at one time to meet their needs, such as small children or people who are ill. Snacks should consist of nourishing foods that supplement and complement a good diet and should not take the place of foods eaten at meals. People who meet most of their food energy requirements from their main meals may need to be careful in their snacking so that they do not exceed their energy needs.










To help people choose good diets based on locally available foods, cultural practices and local health concerns, many countries have developed food guides for their populations, called “Food-based dietary guidelines” (FBDG). These food guides vary in degree of detail and in specific recommendations. Most dietary guidelines group foods into categories of major nutrient content and they usually indicate which foods or groups of foods to eat more often or less often. Some guidelines include a recommended number of servings of foods from the different food groups and portion sizes, while others provide only very general recommendations. In this way, these guidelines provide practical dietary suggestions for people to use to help them develop good diets and eating patterns that meet their health and nutritional needs.

While most food-based dietary guidelines are for the general population, some countries have specific guidelines for different groups, such as children, pregnant women, overweight or obese people and the elderly. Many countries also include recommendations on physical activity and food safety in their guidelines.




### MATERIALS

-  Ask yourself work sheet *My food choices*
-  Work sheet *Why do people eat the foods they eat?*
-  Fact sheet *Food-based dietary guidelines*
-  Ask yourself work sheet *Analysing dietary guidelines*
-  Work sheet *My food guide for better health*
-  Work sheet *Mixed meal model*
-  Work sheet *Eating traditions around the world*




### ACTIVITIES

#### My food choices

-  Answer the questions on the Ask yourself work sheet *My food choices* to see if you are careful about your food choices.

#### Why do people eat the foods they eat?

-  Using the work sheet *Why do people eat the foods they eat?*, make a list of the reasons you think most people select the foods they eat. Include as many reasons as you can think of. How many reasons did you come up with?



Compare your list to what some people say about their food choices.  
(See quotes in the speech bubbles).

- Are all of the reasons related to health? Why or why not?
- What do people's food choices depend on? Cost? Availability of food? Taste? Habit? Time and convenience? Culture and religion?

Use the second page of the work sheet to group the reasons into categories.

## Analysing dietary guidelines



Download the *Food-based dietary guidelines* fact sheet or check the guidelines here: [www.fao.org/ag/humannutrition/nutritioneducation/fbdg/en/](http://www.fao.org/ag/humannutrition/nutritioneducation/fbdg/en/)

Study and compare the guidelines from each of these regions:

- Africa
- Asia and the Pacific
- Europe
- Latin America and the Caribbean
- Near East
- North America.



Use the *Ask yourself work sheet* to analyse the dietary guidelines and to check your understanding of the recommendations for healthy eating.

## My food guide for better health



Using the information from the previous activity and the knowledge you've gained from the previous lessons, create your own food guidelines. A Work sheet *My food guide for better health* is provided to help you develop your personal food guide. Your guide should meet your individual needs and take into consideration your current health and nutritional status and eating habits.

## Mixed meal model



Use the *Mixed meal model* to plan your main meal of the day according to your needs. Keep in mind that to get enough energy and nutrients, we should eat a mixture of foods. A good meal is a combination of different foods containing carbohydrates, protein, fats, vitamins and minerals. The main portion of the meal should include energy-rich starchy carbohydrates such as rice, wheat, cassava, maize or potatoes. The side dishes should be made from meat, fish, poultry, cheese, legumes, vegetables and fruits.

Write or draw the ingredients of your mixed meal in the corresponding sections of the plate model and answer the work sheet questions to analyse your meal.



## Eating traditions around the world

The way people eat differs from culture to culture. Using the Internet, local libraries, experts, other sources available to you, or your own experience, see what you know or can learn about eating habits and traditions in different countries, regions and societies.



Use the Work sheet *Eating traditions around the world* to fill in the gaps in the sentences on how people eat around the world.



### KEY POINTS

**Review these three key points**  
to remember about careful  
food choices and healthful eating habits.  
Check your understanding and see  
how you can apply it to your own life.

### Healthful eating habits

- Meeting our body's nutritional needs should be an important reason for our food choices.
- A healthy diet:
  - includes a variety of foods from different food groups
  - meets the individual needs for calories and nutrients
  - is safe - no risk from toxins, mould or chemicals
  - is enjoyable and culturally acceptable
  - is available and sufficient each day and all year round.
- With careful food selection, a person can obtain all the nutrients they need while enjoying a variety of foods and still maintain a healthy body weight.



## Part 2

# Shopping for good foods



### READING

The purpose of learning about the food groups, the nutrients in food and individual dietary needs is to be able to serve good family meals that meet the food and nutrition needs of every member of the family. Serving good family meals also requires knowing where and how to shop for good foods at good prices, how to make the best food selections, how to plan good nutritious meals and how to store, prepare and cook foods to get the best nutritional value from them. Food must be selected carefully to get the best value for the family budget in terms of nutrients and dietary variety; food has to be stored properly to prevent contamination from harmful germs, chemicals and pests; it also has to be prepared and cooked properly to avoid destroying nutrients in cooking.

Making good meals begins with good planning and good food shopping. When selecting foods to buy in the food store or market, it is important to keep in mind the need to select a wide variety of foods that will meet the nutritional needs of all members of the family.

When deciding what foods to include in the shopping basket, it is helpful to:

- Plan meals in advance.
- Remember what foods and meals have been eaten in the last few days and try to avoid buying the same foods.
- Check what foods there already are at home to avoid waste and repetition.
- Buy only what is needed to avoid waste and spoilage.
- Keep in mind recommendations for variety, quantity and portions:
  - Buy some foods from all of the food groups.
  - Vary the foods selected within each food group.
  - Buy small amounts of foods that should make up only a small amount of the diet (sugar, sweets, fats and oils).
  - For important foods that may be expensive, such as meats, fish, milk and milk products and certain fruits and vegetables, include them in the shopping but buy smaller amounts and when possible, substitute with less expensive similar foods from the same group (for example, dried beans or other legumes instead of meat for protein; choose vegetables and fruits in season).
  - Buy according to the nutritional needs of the family.

#### TO THINK ABOUT WHILE READING



Do you plan your meals in advance?

How do you decide what foods to buy?

Do you know where to buy good foods at good prices?

Do you check and compare the food labels when buying packaged foods?



*When buying grain products:*

- Select a variety of grains, breads and cereals, especially whole unrefined grains.
- Choose pastries, cookies and other sweets less often, as special treats.

*When buying vegetables and fruits:*

- Choose a variety of red, orange or dark green vegetables and fruit; they usually contain more nutrients than those with lighter colours.
- For best flavour and price, purchase fresh fruits and vegetables in season.
- Buy only what can be eaten or preserved in the next few days; fruits and vegetables lose nutrients and flavour when they wilt or spoil.
- Choose frozen vegetables as a convenient alternative to fresh; they can be just as nutritious, they keep well and reduce the amount of preparation time. Canned vegetables are also good, but may have higher amounts of salt.
- Substitute frozen or canned fruit when fresh fruit is not available or is too expensive (but check for added sugars).
- Choose whole fruit over fruit juices (whole fruit has more fibre) and fruit juices instead of fruit drinks. Fruit drinks may have added sugars and only a small amount of fruit juice.

*When buying milk and milk products:*

- Include a variety of milk products, such as cheeses and yoghurts, in addition to milk.
- Look for lower-fat varieties.

*When buying meat and alternatives:*

- Include a variety of red and white meats and poultry.
- Select leaner meats or meats with reduced fat.
- Include a variety of fish and seafood (fresh, tinned or frozen).
- Buy beans, peas and lentils, canned or dried; they are an inexpensive source of protein, are low in fat and high in fibre.
- Include some nuts and seeds as a good source of protein.

The food label on packaged foods can be a useful source of information for food selection and buying. Most countries have laws regulating the information that must be provided on the label of a packaged or processed food. This information might include the name of the food, the amount of food in the package, an ingredient list, and some identifying information on the processing date, expiry date or “best by” date, batch numbers and location of the manufacturer. Additional information may include serving size, number of servings in the package and nutritional information. Some countries also regulate the nutritional or health claims that are allowed on the packaging. For example, in some countries nutritional claims that the product is “low fat” or “low sodium” must meet approved definitions. Health claims on food labels, such as “lowers cholesterol” or “lowers blood pressure” may also be regulated. Many countries



restrict health claims to those that have scientific basis and have been approved by the regulatory agencies. Comparing the nutrient content and serving size of different products, if available, can help in selecting higher quality foods or making choices for special or restricted diets.



### MATERIALS



Match it work sheet *Food shopping and meal planning*



Quiz work sheet *Food choices: true or false?*



Work sheet *My seasonal fruits*



Work sheet *My seasonal vegetables*



Work sheet *Reading food labels*



Fact sheet *Understanding and using food labels*



### ACTIVITIES

#### Food shopping and meal planning



Go to the Match it work sheet and see if you can match the beginning of each sentence with its correct ending.

#### Food choices: true or false?



Take a quick quiz to check your understanding of the best foods to choose, buy and eat.

#### My seasonal fruit and vegetables

Make a list of the fruits and vegetables available in local markets and shops, or that you and your family grow. Find out when each fruit and vegetable is ripe and ready for harvest and sale in your area and where it comes from. When does the season begin? When does it end? When is the peak of the season? How do prices change throughout the season? Does the quality or flavour change?



Fill in the Work sheets *My seasonal fruits* and *My seasonal vegetables*, using the provided symbols or create your own.

You can carry the completed work sheets with you to the shop or the market to use as a pocket guide when choosing your fruit and vegetables.





## Reading food labels

Collect labels of three packaged foods of the same type: for example, three different breads, three yogurts, three cereals, three canned products, three juices, etc. Read the labels attentively and try to get as much information about these foods as you can. Fill in the *Reading food labels* work sheet and compare the products. Which one is a better choice for you?

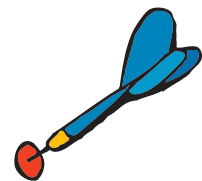


### KEY POINTS

**Review these three key points** to remember about selecting good foods to buy. Check your understanding of them and see how you can apply it to your own life.

### Shopping for food

- Good planning and careful food shopping will help us prepare healthy meals and get the best nutritional value for the price.
- When deciding what foods to buy, it is important to plan meals in advance, avoid repetition, waste and spoilage, keep in mind seasonality and follow recommendations for variety, quality and amounts.
- The labels on packaged foods provide information which can help in selecting the foods which best meet our nutritional and dietary needs.



# My food choices

Are you making good personal food choices? Ask yourself the following questions about your last meal or snack and evaluate your food choices.

1. When did you eat your meal or snack?  
.....
2. Why did you eat at that particular time?  
.....
3. What foods did you eat?  
.....  
.....
4. Why did you select those particular foods to eat?  
.....  
.....
5. Is that the reason why you usually eat what you eat, or do you have other reasons for making your food choices? If so, list the other reasons you eat the foods you eat. What do you think about when choosing foods to eat? (The taste? If it is good for you? If you will have enough of it? If you are eating the same foods often?)  
.....  
.....  
.....
6. How much do you think about the nutritional value of foods when you are making your food choices?  
.....  
.....
7. Are there any food habits or taboos that cause you to avoid eating certain nutritious foods? What are they?  
.....
8. What suggestions can you give to replace nutritious foods that you avoid with other foods of similar nutritional value?  
.....  
.....





# Why do people eat the foods they eat?

**What do people's food choices depend on?**  
**Make a list** of all the reasons why people choose the foods they eat.  
**Write down** as many reasons as you can think of.  
**Then group the reasons** into the categories on the second page of the work sheet.

List the reasons here:

- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....

**Some examples for you...**

- Our religion does not allow us to eat certain foods.
- I am allergic to some foods.
- I eat snacks when I am bored or feel lonely...
- We have traditional foods that we always eat.
- I look for special offers and foods on sale.
- I am a vegetarian. I don't eat meat.
- I have a busy schedule, so I need to eat quickly.
- I buy foods that are available in the shops in my neighbourhood.
- We eat what we can grow, hunt and catch.
- I choose foods that help keep my weight down.
- I am trying to eat healthily.



Now group the reasons into the following categories:

Health

- .....
- .....
- .....
- .....

Habit

- .....
- .....
- .....
- .....

Cost

- .....
- .....
- .....
- .....

Time and convenience

- .....
- .....
- .....
- .....

Availability of food

- .....
- .....
- .....
- .....

Culture and religion

- .....
- .....
- .....
- .....

Taste

- .....
- .....
- .....
- .....

Other reasons

- .....
- .....
- .....
- .....



# Food-based dietary guidelines

## AFRICA



### Namibia

- Eat a variety of foods.
- Eat vegetables and fruit every day.
- Eat more fish.
- Eat beans or meat regularly.
- Use whole-grain products.
- Use only iodised salt, but use less salt.
- Eat at least three meals a day.
- Avoid drinking alcohol.
- Consume clean and safe water and food.
- Achieve and maintain a healthy body weight.



### South Africa

For adults and children over the age of seven years:

- Enjoy a variety of foods.
- Be active.
- Make starchy foods the basis of most meals.
- Eat dry beans, split peas, lentils and soya regularly.
- Chicken, fish, milk, meat or eggs can be eaten daily.
- Drink lots of clean, safe water.
- Eat plenty of vegetables and fruits every day.
- Eat fats sparingly.
- Use salt sparingly.
- Use food and drinks containing sugar sparingly and not between meals.
- If you drink alcohol, drink sensibly.

## ASIA AND THE PACIFIC

### China

- Eat a variety of foods, with cereals as the staple.
- Consume plenty of vegetables, fruits and tubers.
- Consume milk, beans, or bean-products every day.
- Consume appropriate amounts of fish, poultry, eggs and lean meat; reduce fatty meat and animal fat in the diet.
- Balance food intake with physical activity to maintain a healthy body weight.



- Choose a light diet that is also low in salt.
- If you drink alcoholic beverages, do so in limited amounts.
- Avoid unsanitary and spoiled foods.



### Thailand

- Eat a variety of foods from each of the 5 food groups and maintain proper weight.
- Eat adequate amount of rice or alternative carbohydrate sources.
- Eat plenty of vegetables and fruits regularly.
- Eat fish, lean meat, eggs, legumes and pulses regularly.
- Drink milk in appropriate quality and quantity for one's age.
- Eat a diet containing appropriate amounts of fat.
- Avoid sweet and salty foods.
- Eat clean and safe food.
- Avoid or reduce the consumption of alcoholic beverages.



### India

- Nutritionally adequate diet should be consumed through a mix: choice from a variety of foods.
- Additional food and extra care are required during pregnancy and lactation.
- Exclusive breast-feeding should be practiced for 4-6 months. Breast-feeding can be continued up to two years.
- Food supplements should be introduced to infants by 4-6 months.
- Adequate and appropriate diet should be taken by children and adolescents, both in health and disease.
- Green leafy vegetables, other vegetables and fruits should be used in plenty.
- Cooking oils and animal foods should be used in moderation, and vanaspati/ghee/butter should be used only sparingly.
- Over-eating should be avoided to prevent over-weight and obesity. Proper physical activity is essential to maintain desirable body weight.
- Salt should be used in moderation.
- Foods consumed should be safe and clean.
- Healthy and positive food concepts and cooking practices should be adopted.
- Water should be taken in adequate amounts and beverages should be consumed in moderation.
- Processed and ready-to-eat foods should be used judiciously.
- Sugar should be used sparingly.
- The elderly should eat a nutrient-rich diet to keep fit and active.





## EUROPE

### Bulgaria

- Eat a nutritious diet with variety of foods. Do eat regularly, take enough time and enjoy your food in friendly environment.
- Consume cereals as an important source of energy. Prefer wholegrain bread and other wholegrain products.
- Eat a variety of vegetables and fruits more than 400 grams every day, preferably raw.
- Prefer milk and dairy products with low fat and salt content.
- Choose lean meat, replace meat and meat products often with fish, poultry or pulses.
- Limit total fat intake, especially animal fat. Replace animal fats with vegetable oils when cooking.
- Limit the consumption of sugar, sweets and confectionery, avoid sugar-containing soft drinks.
- Reduce intake of salt and salty foods.
- If you drink alcoholic beverages, you should consume moderate quantities.
- Maintain a healthy body weight and be physically active every day.
- Drink plenty of water every day.
- Prepare and store the food in a way to ensure its quality and safety.

### Ireland

- Enjoy your food!
- Eat a variety of different foods, using the Food Pyramid as a guide.
- Eat the right amount of food to be a healthy weight, and exercise regularly. Foods with a lot of fibres fill you up quickly, so you'll be less likely to want high-fat foods. This will help you be a healthy weight.
- Eat 4 or more portions of fruit and vegetables every day. Try and get into the habit of having at least one portion of fruit juice, fruit or vegetable at every meal.
- Eat more foods rich in starch- breads, cereals, potatoes, pasta and rice. Aim to have at least 6 servings a day.
- Eat plenty of foods rich in fibres - breads and cereals (especially whole grain) potatoes, pasta and rice; and fruit and vegetables.
- Reduce the amount of fatty foods you eat, especially saturated fats. Make lower fat choices whenever possible. Grill, boil, oven bake, or stir-fry in very little fat instead of deep-frying. Try eating fewer foods from the top of the Food Pyramid.
- If you drink alcohol, keep within sensible limits. Preferably, drink with meals and try to make every second day an alcohol free day.
- Use a variety of seasonings; try not to always rely on salt to flavour foods. Use herbs, spices and black pepper as alternatives.



- If you drink or eat snacks containing sugar, limit the number of times you take them throughout the day. This is particularly important for children's growing teeth.

## LATIN AMERICA AND THE CARIBBEAN



### Dominica

- Start the day with breakfast
- Always try to eat a variety of foods everyday. Use the basket to help you make the choices.
- Eat more vegetables and fruits everyday.
- Reduce fat and oil intake.
- Choose less sweet foods and drinks.
- Use less salt, salted foods, seasonings and salty snacks.
- Make physical activity a part of your daily life.
- Drink water several times a day.
- If you use alcohol do so in moderation.



### St. Lucia

- Always try to eat vegetables, starches, peas or beans every day.
- Eat more vegetables and fruits every day.
- Buy less fatty and greasy foods and when you cook, use less fats and oils.
- Use less salt, salted foods, packaged seasonings and salty snacks.
- Choose less beverages and packaged foods with added sugar.
- If you drink alcohol, do so in moderation.
- Keep moving - be more active every day.
- Drink water several times a day.



### St. Vincent and the Grenadines

- Eat a variety of foods from the Foods Groups in the breadfruit.
- Eat more fruits and vegetables everyday.
- Reduce fats and oils by cutting back on fatty, oily and greasy foods.
- Reduce the intake of sugar: Use less sugar, sweet foods and drinks.
- When cooking, use less salt and salted seasonings. Eat less salted foods and snacks.
- Water is essential. Drink it several times a day.
- If you use alcohol do so sparingly both in drinking and in food preparation.
- Get moving! Increase physical activity daily.





## NEAR EAST



## Oman

- Vary your diet making it healthy and balanced.
- Choose whole grains and cereals, and consume potatoes, with their skin.
- Consume 3-5 servings of vegetables daily.
- Consume 2-4 servings of fruits daily.
- Consume fish, poultry, eggs or lean meat.
- Consume 1 serving of legumes daily.
- Consume milk or dairy products daily.
- Limit your fat intake and choose your snacks wisely.
- Follow the five keys to safer food.
- Be active and exercise regularly and drink plenty of water.

## NORTH AMERICA



## Canada

- Enjoy a variety of food.
- Emphasize cereals, breads, other grain products, vegetables and fruits.
- Choose lower-fat dairy products, leaner meats and foods prepared with little or no fat.
- Achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating.
- Limit salt, alcohol and caffeine.

## USA

***Adequate nutrients within calorie needs*****Key recommendations:**

- Consume a variety of nutrient-dense foods and beverages within and among the basic food groups while choosing foods that limit the intake of saturated and trans fats, cholesterol, added sugars, salt, and alcohol.
- Meet recommended intakes within energy needs by adopting a balanced eating pattern, such as the USDA Food Guide or the DASH Eating Plan.

**Key Recommendations for Specific Population Groups**

- People over age 50. Consume vitamin B<sub>12</sub> in its crystalline form (i.e., fortified foods or supplements).
- Women of childbearing age who may become pregnant. Eat foods high in heme-iron and/or consume iron-rich plant foods or iron-fortified foods with an enhancer of iron absorption, such as vitamin C-rich foods.



- Women of childbearing age who may become pregnant and those in the first trimester of pregnancy. Consume adequate synthetic folic acid daily (from fortified foods or supplements) in addition to food forms of folate from a varied diet.
- Older adults, people with dark skin, and people exposed to insufficient ultraviolet band radiation (i.e., sunlight). Consume extra vitamin D from vitamin D-fortified foods and/or supplements.

### **Weight management**

#### **Key Recommendations**

- To maintain body weight in a healthy range, balance calories from foods and beverages with calories expended.
- To prevent gradual weight gain over time, make small decreases in food and beverage calories and increase physical activity.

#### **Key Recommendations for Specific Population Groups**

- Those who need to lose weight. Aim for a slow, steady weight loss by decreasing calorie intake while maintaining an adequate nutrient intake and increasing physical activity.
- Overweight children. Reduce the rate of body weight gain while allowing growth and development. Consult a healthcare provider before placing a child on a weight-reduction diet.
- Pregnant women. Ensure appropriate weight gain as specified by a healthcare provider.
- Breastfeeding women. Moderate weight reduction is safe and does not compromise weight gain of the nursing infant.
- Overweight adults and overweight children with chronic diseases and/or on medication. Consult a healthcare provider about weight loss strategies prior to starting a weight-reduction program to ensure appropriate management of other health conditions.

### **Physical activity**

#### **Key Recommendations**

- Engage in regular physical activity and reduce sedentary activities to promote health, psychological well-being, and a healthy body weight.
- To reduce the risk of chronic disease in adulthood: Engage in at least 30 minutes of moderate-intensity physical activity, above usual activity, at work or home on most days of the week.
- For most people, greater health benefits can be obtained by engaging in physical activity of more vigorous intensity or longer duration.
- To help manage body weight and prevent gradual, unhealthy body weight gain in adulthood: Engage in approximately 60 minutes of moderate- to vigorous intensity activity on most days of the week while not exceeding caloric intake requirements.



- To sustain weight loss in adulthood: Participate in at least 60 to 90 minutes of daily moderate-intensity physical activity while not exceeding caloric intake requirements. Some people may need to consult with a healthcare provider before participating in this level of activity.
- Achieve physical fitness by including cardiovascular conditioning, stretching exercises for flexibility, and resistance exercises or calisthenics for muscle strength and endurance.

### Key Recommendations for Specific Population Groups

- Children and adolescents. Engage in at least 60 minutes of physical activity on most, preferably all, days of the week.
- Pregnant women. In the absence of medical or obstetric complications, incorporate 30 minutes or more of moderate-intensity physical activity on most, if not all, days of the week. Avoid activities with a high risk of falling or abdominal trauma.
- Breastfeeding women. Be aware that neither acute nor regular exercise adversely affects the mother's ability to successfully breastfeed.
- Older adults. Participate in regular physical activity to reduce functional declines associated with aging and to achieve the other benefits of physical activity identified for all adults.

### Food groups to encourage

#### Key Recommendations

- Consume a sufficient amount of fruits and vegetables while staying within energy needs. Two cups of fruit and 2 ½ cups of vegetables per day are recommended for a reference 2,000 calorie intake, with higher or lower amounts depending on the calorie level.
- Choose a variety of fruits and vegetables each day. In particular, select from all five vegetable subgroups (dark green, orange, legumes, starchy vegetables, and other vegetables) several times a week.
- Consume 3 or more ounce-equivalents of whole-grain products per day, with the rest of the recommended grains coming from enriched or whole-grain products. In general, at least half the grains should come from whole grains.
- Consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

### Key Recommendations for Specific Population Groups

- Children and adolescents. Consume whole-grain products often; at least half the grains should be whole grains. Children 2 to 8 years should consume 2 cups per day of fat-free or low-fat milk or equivalent milk products. Children 9 years of age and older should consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.



## Fats

### Key Recommendations

- Consume less than 10 percent of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep trans fatty acid consumption as low as possible.
- Keep total fat intake between 20 to 35 percent of calories, with most fats coming from sources of polyunsaturated and monounsaturated fatty acids, such as fish, nuts, and vegetable oils.
- When selecting and preparing meat, poultry, dry beans, and milk or milk products, make choices that are lean, low-fat, or fat-free.
- Limit intake of fats and oils high in saturated and/or trans fatty acids, and choose products low in such fats and oils.

### Key Recommendations for Specific Population Groups

- Children and adolescents. Keep total fat intake between 30 to 35 percent of calories for children 2 to 3 years of age and between 25 to 35 percent of calories for children and adolescents 4 to 18 years of age, with most fats coming from sources of polyunsaturated and monounsaturated fatty acids, such as fish, nuts, and vegetable oils.

## Carbohydrates

### Key Recommendations

- Choose fiber-rich fruits, vegetables, and whole grains often.
- Choose and prepare foods and beverages with little added sugars or caloric sweeteners, such as amounts suggested by the USDA Food Guide and the DASH Eating Plan.
- Reduce the incidence of dental caries by practicing good oral hygiene and consuming sugar- and starch-containing foods and beverages less frequently.

## Sodium and potassium

### Key Recommendations

- Consume less than 2,300 mg (approximately 1 tsp of salt) of sodium per day.
- Choose and prepare foods with little salt. At the same time, consume potassium-rich foods, such as fruits and vegetables

### Key Recommendations for Specific Population Groups

- Individuals with hypertension, blacks, and middle-aged and older adults. Aim to consume no more than 1,500 mg of sodium per day, and meet the potassium recommendation (4,700 mg/day) with food.



### ***Alcoholic beverages***

#### **Key Recommendations**

- Those who choose to drink alcoholic beverages should do so sensibly and in moderation—defined as the consumption of up to one drink per day for women and up to two drinks per day for men.
- Alcoholic beverages should not be consumed by some individuals, including those who cannot restrict their alcohol intake, women of childbearing age who may become pregnant, pregnant and lactating women, children and adolescents, individuals taking medications that can interact with alcohol, and those with specific medical conditions.
- Alcoholic beverages should be avoided by individuals engaging in activities that require attention, skill, or coordination, such as driving or operating machinery.

### ***Food safety***

#### **Key Recommendations**

- To avoid microbial foodborne illness:
- Clean hands, food contact surfaces, and fruits and vegetables. Meat and poultry should not be washed or rinsed.
- Separate raw, cooked, and ready-to-eat foods while shopping, preparing, or storing foods.
- Cook foods to a safe temperature to kill microorganisms.
- Chill (refrigerate) perishable food promptly and defrost foods properly.
- Avoid raw (unpasteurized) milk or any products made from unpasteurized milk, raw or partially cooked eggs or foods containing raw eggs, raw or undercooked meat and poultry, unpasteurized juices, and raw sprouts.

#### **Key Recommendations for Specific Population Groups**

- Infants and young children, pregnant women, older adults, and those who are immunocompromised. Do not eat or drink raw (unpasteurized) milk or any products made from unpasteurized milk, raw or partially cooked eggs or foods containing raw eggs, raw or undercooked meat and poultry, raw or undercooked fish or shellfish, unpasteurized juices, and raw sprouts.
- Pregnant women, older adults, and those who are immunocompromised: Only eat certain deli meats and frankfurters that have been reheated to steaming hot.



# Analysing dietary guidelines

**Study and compare dietary guidelines from different countries around the world. Fill in this work sheet to check your understanding of dietary recommendations.**

1. Do the guidelines always divide foods into groups? Yes  No   
If so, what are the food groups?

.....  
.....

2. Do all the guidelines have the same number of food groups? Yes  No

3. In your opinion, how are foods put into groups?

.....  
.....  
.....

4. What differences exist in the food groups recommended by each country?

.....  
.....  
.....

5. If foods are not divided into groups, what are the recommendations for amounts to eat?

.....  
.....  
.....

6. What is included in the protein group?

.....  
.....  
.....

7. Is there a separate "Dairy" or "Milk" group? Yes  No   
What foods are there?

.....  
.....  
.....



Analysing dietary guidelines (cont.)

8. Are vegetables and fruit in the same group or in two different groups? Do you think they should be in the same group? Why or why not?

.....  
.....

9. Are there any differences between amounts or portions recommended for each group? Describe those differences. **Yes  No**   
What are the recommendations for amounts of foods?

.....  
.....

10. Do all guidelines recommend moderation for fats, sugars and alcohol? Find and list these recommendations. **Yes  No**

.....  
.....

11. Are there any recommendations for specific age groups, such as children, adolescents or pregnant women?  
If so, what are the recommendations. **Yes  No**

.....  
.....

12. Are there any other recommendations, for example, on food safety or physical activity? List these and describe the differences.

.....  
.....

13. Examine the guidelines for Namibia and compare them to a more detailed guide such as the one for India or the USA. Which approach (general or more specific) would be most successful in your country and why? Which approach would be most effective to use with your family?

.....  
.....

14. What would you change, remove or add to the guides and why?

.....  
.....



**★ You need to read the Fact sheet Food-based dietary guidelines before you can complete this work sheet.**



# My food guide for better health

Make your own personal food guide based on your nutritional needs, health and eating habits. Be realistic and try to follow your food guide!

*I will try to...*

• • • eat or drink **more** of:

.....  
.....

• • • eat or drink **less** of:

.....  
.....

• • • eat **plenty** of:

.....  
.....

• • • eat a greater **variety** of:

.....  
.....

• • • eat foods **rich in**:

.....  
.....

• • • eat or drink **moderate** amounts of:

.....  
.....

• • • **cook with more**:

.....  
.....

• • • cook **with less**:

.....  
.....

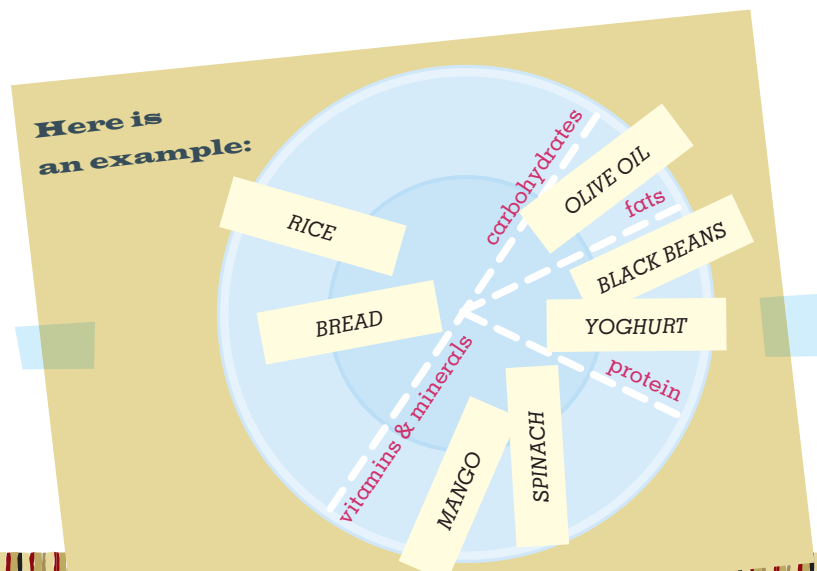
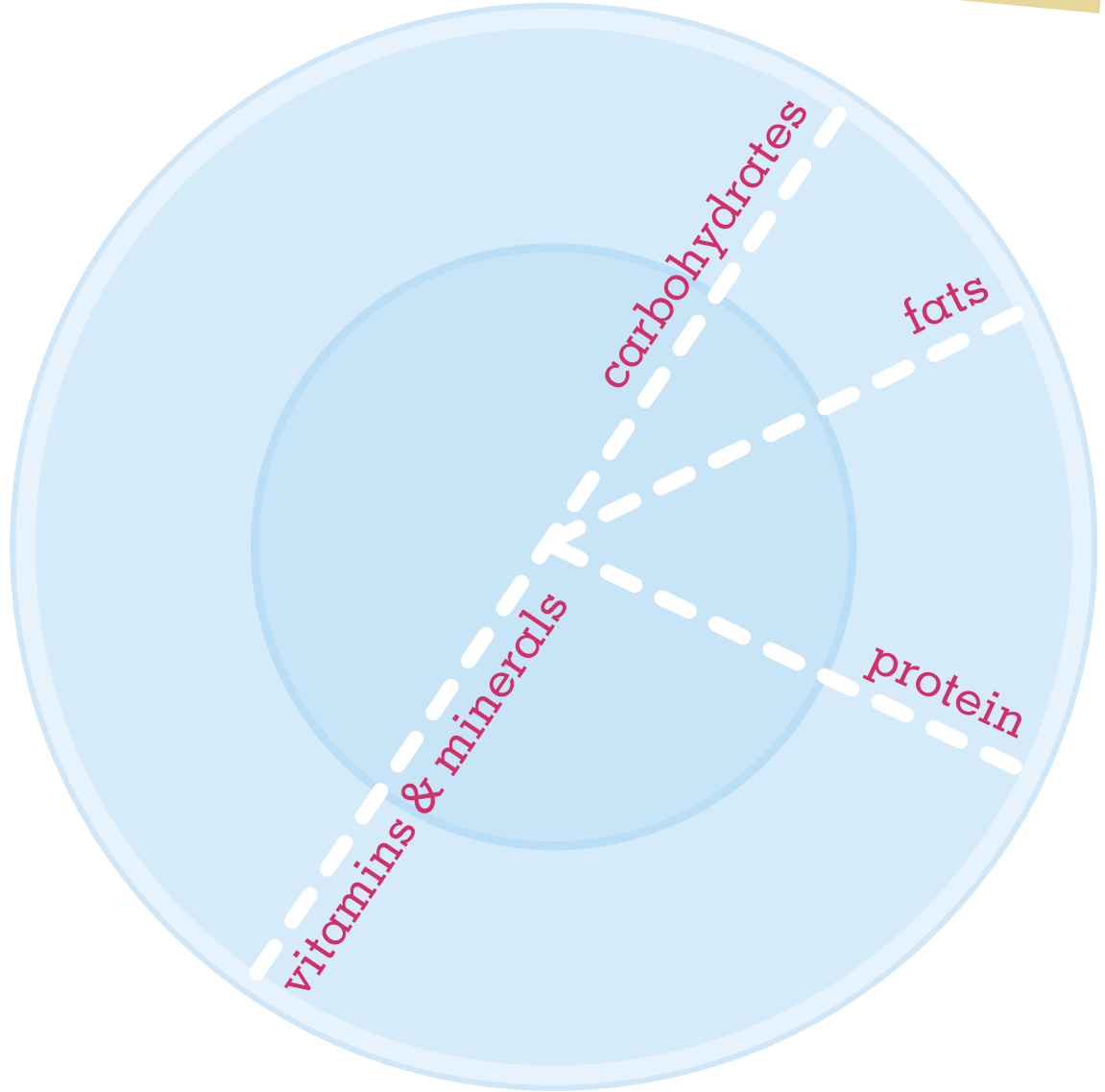






# Mixed meal model

**Plan a main meal** for yourself based on your nutritional needs.  
**Write or draw all the foods and ingredients** in the correct sections of the plate model.  
**Then evaluate your meal** by answering the 6 questions.



1. Is the meal healthy, varied and balanced? Yes  No

2. What macronutrients do you get from it?

.....

.....

.....

3. What micronutrients do you get from it?

.....

.....

.....

4. What kind of healthy drinks can be taken with this meal?

.....

.....

.....

5. Are most of your meals healthy and varied?

.....

.....

.....

6. How can you improve your meals to make sure you get what you need from your food?

.....

.....

.....





# Eating traditions around the world

Carry out a research to see what you can find out about eating habits and traditions in different countries and societies.

Then complete the sentences on this work sheet by writing in the names of countries or societies where each eating habit is practised.

- In ..... people eat their **main meal in the morning**;  
in ..... people eat their main meal **in the middle of the day**;  
in ..... people eat their main meal **at the end of the day**.
- In ..... people **usually eat twice** a day;  
in ..... people normally eat **three times** a day.
- In ..... **families** usually **eat together**;  
in ..... adults eat **separately from children**;  
in ..... men eat **separately from women**.
- In ..... **people** eat **around the table**, from **their own plates**,  
using a **knife, fork** and **spoon**;  
in ..... people eat from a **common bowl** or large plate;  
in ..... people eat food **with their hands**;  
in ..... people **use chopsticks** to eat their food.
- In ..... mealtime **is an opportunity** for the family **to make conversation**, share **stories**, provide **care** and attention and **teach** children good eating habits in a pleasant atmosphere.  
In ..... families **pray** before eating.  
In ..... people have **rules and beliefs** about foods that are not to be eaten.
- Examples of such **food taboos** are .....



Use the internet, local libraries, local experts, other sources available to you and your own experience. See the links in the activity section of this lesson.

# Food shopping and meal planning

Test your food shopping knowledge. See if you can match the beginning of each sentence on the left with its correct ending on the right.

1. Making a good meal begins with...
2. Buy food according to...
3. Avoid waste and spoilage...
4. Avoid buying the foods...
5. Include meat, fish, milk and other important but expensive foods in the shopping...
6. Substitute expensive foods with...
7. Buy small amounts of...
8. Buy fresh fruits and vegetables...
9. Frozen vegetables are...
10. Canned vegetables may have...

- A. in season to get the best flavour and price.
- B. but buy smaller amounts of them.
- C. higher amounts of salt.
- D. sugar, sweets, fats and oils.
- E. you've eaten in the last few days.
- F. the nutritional needs of the family.
- G. a convenient alternative to fresh vegetables.
- H. by checking what foods there are at home and buying only what is needed.
- I. cheaper foods from the same group, for example, meat with beans.
- J. good planning and good food shopping.



Answer key: 1J; 2F; 3H; 4E; 5B; 6I; 7D; 8A; 9G; 10C.

# Food choices: true or false?

Check your understanding of the best foods to choose, buy and eat.

	True	False
1. It is healthy to eat the same food with the same ingredients every day.	<input type="checkbox"/>	<input type="checkbox"/>
2. Breads made with white flour contain more fibre than those made with whole grains (wheat, bran, oats, rye).	<input type="checkbox"/>	<input type="checkbox"/>
3. Frozen vegetables can be just as nutritious as fresh vegetables.	<input type="checkbox"/>	<input type="checkbox"/>
4. Red, orange or dark green vegetables and fruit usually contain less nutrients than those with lighter colours.	<input type="checkbox"/>	<input type="checkbox"/>
5. Fruit and vegetables maintain nutrients even when they wilt or spoil.	<input type="checkbox"/>	<input type="checkbox"/>
6. We should choose lower-fat milk products more often.	<input type="checkbox"/>	<input type="checkbox"/>
7. We should select high-fat cheese varieties more often.	<input type="checkbox"/>	<input type="checkbox"/>
8. We should buy leaner meats and a variety of fresh, tinned or frozen fish.	<input type="checkbox"/>	<input type="checkbox"/>
9. Beans, peas and lentils are a less expensive source of protein, and they are low in fat and high in fibre.	<input type="checkbox"/>	<input type="checkbox"/>
10. We should prefer fruit drinks to real fruit juices.	<input type="checkbox"/>	<input type="checkbox"/>



Answer key: 1 False, 2 False, 3 True, 4 False, 5 True, 6 True, 7 False, 8 True, 9 True, 10 False.



# My seasonal fruits

List the fruits available in local shops and markets or that you or your family grow. Find out when each fruit is ripe and ready for harvest and sale in your area and where it comes from. When does the season begin? When does it end? When is the peak of the season? How do prices change throughout the season? Does the quality or flavour change? Fill in the work sheet with the symbols provided or create your own.

Fruit	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.



★ You can carry the table with you to the shop or to the market to use as a pocket guide when choosing your fruits.

- ⤴ season begins
- ⤵ locally grown
- ⤴ peak season
- ⤵ grown far away
- ⤴ season ends



# My seasonal vegetables

List the vegetables available in local shops and markets or that you or your family grow. Find out when each vegetable is ripe and ready for harvest and sale in your area and where it comes from. When does the season begin? When does it end? When is the peak of the season? How do prices change throughout the season? Does the quality or flavour change? Fill in the work sheet with the symbols provided or create your own.

Vegetables	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.



You can carry the table with you to the shop or to the market to use as a pocket guide when choosing your vegetables.

- ↖ season begins
- ↗ peak season
- ↘ season ends
- locally grown
- ← grown far away



# Reading food labels

Collect labels of three packaged foods of the same type (three different breads, three yogurts, three juices, etc).  
 Read the labels and fill in this work sheet with the information you find on the label.  
 Compare the foods and decide which one is a better choice for you.

	Food A	Food B	Food C
Name of food	.....	.....	.....
Processing date	.....	.....	.....
Expiry date	.....	.....	.....
Manufacturer's name and address	.....	.....	.....
Ingredients	.....	.....	.....
Amount of food in the package	.....	.....	.....
Number of servings in the package	.....	.....	.....
Serving size	.....	.....	.....
Nutrition information (nutrient content)	.....	.....	.....
Nutritional claims (low fat, low sodium, no added sugar)	.....	.....	.....
Health claims (lowers cholesterol, lowers blood pressure)	.....	.....	.....
Additional information	.....	.....	.....

Your choice:

- Food A. Why? .....
- Food B. Why? .....
- Food C. Why? .....





# Understanding and using food labels

**The food label on packaged foods can be a useful source of information for choosing and buying foods.**  
 Comparing the nutrient content and serving size of different products can help in planning healthy meals and snacks and selecting foods that meet individual nutritional needs.  
**Food labels are especially useful for people who need to follow special or restricted diets.**

NUTRITION INFORMATION			
• Servings Per Package: 10		Serving Size: 30ml	
Avg Quantity	Per Serving	Per 100ml	%DV
• ENERGY	246kJ	819kJ	
• PROTEIN	0.8g	2.6g	
FAT, Total	5.7g	19.0g	9%
- Saturated Fat	4.0g	13.4g	18%
- Trans Fat	0.03g	0.1g	
- Polyunsaturated	0.03g	0.1g	
- Monounsaturated	0.03g	0.1g	
- Cholesterol	20mg	66.6g	7%
CARBOHYDRATE	1.2g	4.1g	0%
- Sugars	1.0g	3.3g	
- Dietary Fibre	0g	0g	
SODIUM	10mg	32mg	1%
• CALCIUM	35.1mg	117mg	
POTASSIUM	46.5mg	151mg	

1 Serving Size

2 Serving Unit

3 Calories

4 Protein

5 Fats

6 Carbohydrates

7 Micronutrients

8 Daily Values

## Reading food labels

The main or top section of the label (see nos. 1–4 and no. 6 on the sample label on page 2) contains information specific to that particular food product, such as the number of calories in a specific serving or portion size and the nutrients provided in each serving of that food.



The bottom part (see no. 5 on the sample label below) contains a footnote with Daily Values (DVs) for 2 000 and 2 500 calorie diets. This footnote provides recommended dietary information for important macro and micronutrients, including fats, sodium and fibre. The percentage of Daily Values helps to determine if a serving of food is high or low in a nutrient. It is useful as a general guide, even if you do not know how many calories you consume in a day. The footnote is found only on larger packages and does not change from product to product.

1 Start Here

2 Check Calories

3 Limit these Nutrients

4 Get Enough of these Nutrients

5 Footnote

<b>Nutrition Facts</b>	
Serving Size 1 cup (228g) Servings Per Container 2	
Amount Per Serving	
<b>Calories</b> 250	Calories from Fat 110
	% Daily Value*
<b>Total Fat</b> 12g	<b>18%</b>
Saturated Fat 3g	<b>15%</b>
Trans Fat 3g	
<b>Cholesterol</b> 30mg	<b>10%</b>
<b>Sodium</b> 470mg	<b>20%</b>
<b>Total Carbohydrate</b> 31g	<b>10%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars 5g	
<b>Protein</b> 5g	
Vitamin A	<b>4%</b>
Vitamin C	<b>2%</b>
Calcium	<b>20%</b>
Iron	<b>4%</b>

\* Percent Daily Values are based on a 2,000 calories diet. Your Daily Values may be higher or lower depending on your calories needs.

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

6

Quick Guide to % DV

• 5% or less is Low

• 20% or more is High





### LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- know how to choose safe, good foods in the shops and markets;
- recognize the signs of spoiled, poor-quality foods;
- explain how to prepare and store food safely at home.

### Lesson 8

## Keeping foods safe and nutritious

### LESSON OVERVIEW



This lesson is about making sure that the foods we eat are clean, fresh and nutritious. It explains that for us to be healthy and avoid illnesses from contaminated or spoiled food, the food we eat needs to be safe and free from harmful germs, chemicals and other materials. It discusses how choosing good foods to buy and storing and preparing foods safely at home helps protect the safety and quality of what we eat and can help protect our health. Checklists of what to look for to be able to choose safe, good quality foods in the markets and shops are provided, along with tips for protecting the quality and safety of food at home.



**Part 1**

# Food quality and safety in the shops, markets and streets



## READING

For us to be healthy and to get the best from our food, the food we eat and the water we drink need to be safe and clean. Fresh and clean foods are important for good nutrition. Foods need to be grown and handled properly so that they provide the best nutritional quality possible. They need to be kept free from harmful germs, chemicals and other materials that can make us sick and harm our health. Bacteria and germs can contaminate food in different ways:

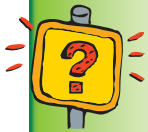
- with soil or water where it is grown
- during handling, preparation, storing, selling and serving
- by dirty hands
- by flies, mice, rats and other insects and rodents
- by cross-contamination (when clean foods touch contaminated foods or surfaces).

Eating contaminated food can result in illness (diarrhoea, vomiting, upset stomach, fever or cramps) caused by bacteria in the food. Most illnesses from eating contaminated or spoiled food can be avoided if food is handled, prepared, cooked and stored properly and if basic cleanliness and personal hygiene practices are followed.

It is important to protect the safety and quality of the foods we eat at all times. Food needs to be kept safe during growing, harvesting, moving from the field, processing, storing, selling, and finally preparing and eating it. Knowing how to choose good foods in the shops and how to store and prepare food safely at home can protect the safety and quality of what we eat and can help protect our health.

Shops, markets and other food sellers can take many actions to keep food free from harmful germs, insects, pests and other sources of harmful contamination. Some countries have laws that regulate and inspect stores, markets and street food vendors to be sure that proper food safety procedures are being followed. Everyone should know some of the basic handling and selling procedures that can help keep food safe and of good quality and be sure that these procedures are being followed before buying food. It is best to buy foods from shops or markets that can be trusted to sell safe foods and that provide a good setting and clean conditions for the foods they sell.

### TO THINK ABOUT WHILE READING



Do all shops, markets and street stalls sell safe and good quality food?

What conditions should people check for in the markets and shops?










What are the signs of spoiled, poor quality food?



When selecting foods to buy, check their freshness, appearance, variety, quality and price, but also pay attention to the cleanliness of the shop, the vendor and the surroundings in which the food is being sold. The personal hygiene of food sellers is very important. Their clothing and hands should be clean and washed frequently.





### MATERIALS

-  Fact sheet *Basic conditions for selling food*
-  Fact sheet *Choosing good quality foods*
-  Match it work sheet *What to look for when buying food*
-  Into the field work sheet *Food safety inspection – fresh fruits and vegetables*
-  Into the field work sheet *Food safety inspection – dry, non-perishable foods*
-  Into the field work sheet *Food safety inspection – fresh, perishable foods*
-  Fact sheet *Recognizing the signs of poor quality foods*
-  Quiz work sheet *Recognizing the signs of good or spoiled foods*
-  Into the field work sheet *School canteen inspection*

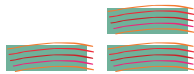


### ACTIVITIES

#### What to look for when buying food

-   Review the Fact sheet *Basic conditions for selling food*, then go to the Match it work sheet and match the beginning of each condition with its correct ending.

#### Food safety inspection



*If you are working alone*, visit a market, a grocery store or a street stall and fill in the Into the field work sheets *Food safety inspection – fresh fruits and vegetables*, *Food safety inspection – dry, non-perishable foods* and *Food safety inspection – fresh, perishable foods* to see if food safety rules are observed.

*If you are working as a class*, divide into three groups and review the rules on storing and selling of:

- Group 1. Fresh fruits and vegetables
- Group 2. Dry foods such as flour, grains, legumes
- Group 3. Fresh foods such as milk, meat, fish, eggs.



Visit your local markets, grocery stores or street stalls to see if these rules are observed and what can be done to improve the way foods are stored and sold. Fill in the Into the field work sheets during your food safety inspection. Create a presentation for the parents, teachers, officials and other community members and share with them the results of your investigation.

## Recognizing signs of good or spoiled food



Review the Fact sheet *Recognizing signs of poor quality foods*. Then take a quick quiz to see if the foods listed are likely to be safe or unsafe to eat.

## Inspect your school canteen



Imagine you have been asked to inspect your school canteen or cafeteria. Collect as much information as possible using the Into the field work sheet *School canteen inspection*. Write a brief report based on the information you gathered and present it to your school.

## Food safety rules and laws

Find out what local or national rules and laws regulate the handling and selling of foods in the markets, stores, streets in your area.

- Are the shops and markets inspected often?
- How are the rules enforced?
- How can people be sure the rules are followed?
- What can people do to report problems and violations?
- What can people do if the rules are not sufficient or if there are no rules and regulations?
- How can individuals and community groups work with local authorities to improve the situation?

### KEY POINTS

**Review these three key points** to remember about food safety in the shops and markets. Apply this knowledge to your own food shopping and share it with others.

### Food safety in the shops and markets

- For us to be healthy and to get the best from our food, the shops and markets need to sell good quality, safe food free from harmful germs, insects, pests and other harmful sources.
- When choosing where to shop, people should pay attention to the cleanliness of the shop, the vendor and the surroundings in which the food is being sold and check that basic rules of food safety and hygiene are being followed.
- Consumers can protect their health by choosing and buying unspoiled, good quality foods and learning to recognize signs of spoiled food.



**Part 2**

# Protecting the quality and safety of food at home



## READING

Preparing and cooking food properly can help protect the nutrients in foods. Nutrients are affected by contact with air, heat, light and chemicals. It is important to cook foods with sufficient heat to kill harmful bacteria, but it is also important not to destroy the nutrient content of foods by overcooking. When foods are boiled for a long time, many of the important nutrients dissolve in the cooking water. If the cooking water is thrown away and not eaten, fewer nutrients will be consumed. Correct food preparation and cooking will help ensure the nutritional quality and safety of foods and meals prepared for the family.

### Preserve the nutrients in foods:

- Cook or reheat food properly, avoiding overcooking which can destroy nutrients.
- Cook and eat vegetables the same day you purchase or pick them and try to choose them at their peak of ripeness.
- Prepare and cut vegetables right before they are cooked or eaten, rather than preparing them in advance and then leaving them exposed to the air or sitting in water.
- Cook or steam vegetables with as little water as possible, rather than boiling them.
- Save the water in which food was cooked, especially vegetables, meats, fish and legumes, and add it to sauces or soups.
- Cook vegetables and other foods in a soup or stew and eat the broth.
- Serve and eat vitamin A-rich plant foods with some fat to help improve absorption of vitamin A. For example, eat pumpkin and carrots with a small amount of oil.
- Prepare and eat iron-rich plant foods with vitamin C-rich foods to help absorption. For example, eat leafy green vegetables and salads with the juice of a lemon.

### TO THINK ABOUT WHILE READING



Do you know how to protect the nutrients in foods?

Do you prepare and cook food properly?

Do you store food correctly?






Preparing and storing foods properly at home can help prevent spoiling and wasting food. The proper preparation and storage of foods for short or long periods of time before or after cooking will help preserve the nutrient content of foods and keep food safe to be eaten at another time. The biggest threat to food safety is harmful bacteria that can contaminate and grow in food. Some of the harmful substances in contaminated food can be passed on to other foods they



come into contact with. While some different practices are needed for different types of foods, all foods must be kept clean and free from foreign particles such as glass or metal, contamination by harmful chemicals and from bacteria, viruses and parasites.






### MATERIALS

-  Fact sheet *Prepare and cook food properly*
-  Fact sheet *Store food properly*
-  Match it work sheet *Tips on how to preserve nutrients in foods*
-  Into the field work sheet *Household food safety inspection*
-  Work sheet *Jumbled foods*




### ACTIVITIES


#### Tips on how to preserve nutrients in foods

-   Review the Fact sheets *Prepare and cook food properly* and *Store food properly*. Discuss or think about the best cooking methods to avoid nutrient losses. Then go to the Match it work sheet and match the beginning of the sentences with their correct endings.
- 

#### Can your home pass a food safety inspection?

-  Inspect your home kitchen area and places where you store food and fill in the Into the field work sheet *Household food safety inspection*. What can you do to improve the way food is prepared and stored in your home?

#### Jumbled food

-  Go to the *Jumbled food work sheet*, unjumble the foods and try to work out where and how they should be stored.

#### Role-play: Storing food correctly

##### *Group activity*

Write the names of locally available foods or draw them on small cards. Be sure to include several foods from each of these groups: **1.** milk, cheese, yogurt raw meat, poultry, eggs, raw fish **2.** fresh fruit and vegetables **3.** rice, dry beans, canned peas, sugar, flour, a bottle of oil, a jar of jam, a can of tomato sauce, bread.





Divide into small groups and role play a family shopping for food. Each group selects food cards representing the foods they want to buy for their family. They pay for their purchases and now need to pack them for carrying home. Ask the players to divide the food cards into separate shopping bags or baskets according to the good handling practices they have learned. Can all the food go in the same bag? Do any foods need to be kept separate?

Now imagine the family are unpacking the shopping bags at home. Ask the players to take out one food at a time and discuss how each food should be stored.

- Does it need to be stored in the freezer?
- Does it need to be kept cool in the refrigerator?
- Where in the refrigerator should it go?
- Does it need to be kept separated from other foods?
- Does it need special wrapping? or containers?
- Can it be stored in cupboards?
- Do any foods need special packaging?
- How should raw and cooked foods be stored?

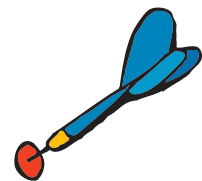


### KEY POINTS

**Review these three key points** to remember about food safety at home. Apply this knowledge to your own food preparation and storage and share it with others.

### Food safety at home

- Keeping foods clean and practising good personal hygiene during food preparation is very important to avoid contamination with harmful bacteria and prevent the spread of disease.
- Foods need to be cooked enough to make them safe to eat but not too much to destroy their nutrients.
- Storing foods properly at home will help protect their quality and safety and avoid wasting food.



# Basic conditions for selling food

When shopping for your food, always check that...

- ✓ The shop, area, space and surroundings are **clean and free of rubbish**.
- ✓ Shelves and display areas are kept **clean**.
- ✓ Food is kept **off the floors**.
- ✓ Food is stored in airtight, **covered containers** and protected from moisture, insects, rodents and other pests.
- ✓ **Different kinds** of foods, such as eggs, meat, fish and vegetables, are kept **separated from each other**.
- ✓ Foods are kept at **appropriate temperatures**.
- ✓ **Hot foods** are kept **hot**.
- ✓ Foods that need **refrigeration** are kept sufficiently **cold**.
- ✓ **Frozen foods** are kept **frozen**.
- ✓ Foods are kept **separated from non-food items** (such as cleaning products).
- ✓ Foods that have **expired** or spoiled are **removed promptly**.
- ✓ **Food handlers** and preparers have access to **hand washing** facilities (clean water and soap) and **use gloves** to handle food.



★ This will help you complete the Work sheet What to look for when buying food

# Choosing good quality foods

**Fresh fruits and vegetables** should be kept at cool temperatures, in a cool and dry place. Fruits and vegetables lose their nutrients and spoil easily and need to be handled carefully to protect their freshness and quality. They should be fresh and not soft or limp, and should not have spots or other signs of damage, spoilage or insects.

## **In the shop or market:**

- ✓ They should be kept off the ground and out of the sun.
- ✓ They should be touched as little as possible, using disposable gloves if possible.
- ✓ Spoiled fruits and vegetables should be separated and promptly removed from bins, boxes or shelves where they are stored and displayed.
- ✓ Packaged fruits and vegetables should have no signs of moisture, dirt, insects or other foreign objects inside.

**Dry, non-perishable foods**, such as flour, salt, sugar, legumes (beans, lentils), grains (rice, maize, oats) and seeds should be kept in a dry, clean place free from insects, rodents or other animals.

## **When these foods are sold from large, open containers or sacks in the shop or market:**

- ✓ The place of sale should be clean.
- ✓ The food should be kept off the ground and covered with a cover or a cloth.
- ✓ The container should be suitable for foods and used only for this purpose.
- ✓ The container should be clean and without holes or perforations.
- ✓ The scoop or dispenser should be clean and for exclusive use (only for that product).

## **When they are sold already packaged in bags, boxes or other containers:**

- ✓ The package should be intact (whole) and in good condition.
- ✓ The package should be free from cracks, tears and holes.
- ✓ There should be no signs of dirt, mould or moisture on the package.
- ✓ The expiration date or sell-by date on the package should not be past.



**Fresh, perishable foods**, such as milk and milk products, raw meats and offal, and eggs must be stored under refrigeration, in compartments separated by product type:

**When these foods are sold unpackaged from large containers or display areas:**

- ✓ The container or area should be used exclusively for that food item; the space should not be shared with or used by other foods
- ✓ The container or area should be kept clean and covered
- ✓ The dispenser should be clean and for exclusive use
- ✓ The smaller containers, bottles, paper or other packaging into which the food is put for taking home should be clean and used only for that food item

**When they are sold already packaged in bags, boxes or other containers:**

- ✓ The package should be intact and in good condition
- ✓ The package should be free from cracks, tears and holes
- ✓ There should be no signs of dirt, mould or moisture on the package
- ✓ The expiration date or sell-by date on the package should not be past.



You can use this as a pocket guide to help you choose good quality food when you are shopping for food

# What to look for when buying food

See if you can match the beginning of the sentence on the left with its correct ending on the right.

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. The shop, its shelves and display areas should be</li> <li>2. The food should not be stored</li> <li>3. The food should be protected from</li> <li>4. The food should be stored</li> <li>5. Such foods as</li> <li>6. Hot foods should be kept</li> <li>7. Foods that need refrigeration should be</li> <li>8. Frozen foods should be</li> <li>9. Foods should be separated from non-food items</li> <li>10. Expired or spoiled foods</li> <li>11. Food handlers and preparers</li> </ol> | <ol style="list-style-type: none"> <li>A. frozen.</li> <li>B. should be removed promptly.</li> <li>C. in airtight, covered containers.</li> <li>D. should wash hands frequently and use gloves to handle food.</li> <li>E. hot.</li> <li>F. moisture, insects, rodents and other pests.</li> <li>G. clean and free of rubbish.</li> <li>H. on the floor.</li> <li>I. sufficiently cold.</li> <li>J. such as cleaning products.</li> <li>K. meat, fish, eggs and vegetables should be separated from each other.</li> </ol> |
|---|--|



Answer key: 1.G, 2.H, 3.F, 4.C, 5.K, 6.E, 7.I, 8.A, 9.J, 10.B, 11.D

# Food safety inspection – fresh fruits and vegetables



Visit a local market, grocery store or street stall and observe the conditions for selling fruits and vegetables.  
Are the basic food safety rules being followed?  
Fill in the work sheet with your observations and suggestions.

Fresh fruit and vegetables are...	Yes	No	Suggestions for improvement
...kept at cool temperatures	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...kept in a dry place	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...kept off the ground	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...kept out of the sun	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...touched as little as possible, using disposable gloves	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...spoiled fruits and vegetables are promptly removed	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...packaged fruits and vegetables have no signs of moisture, dirt, insects, etc.	<input type="checkbox"/>	<input type="checkbox"/>	..... .....

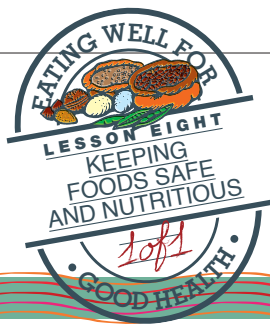


# Food safety inspection – dry, non-perishable foods



Visit a local market, grocery store or street stall and observe the conditions for selling dry foods, such as flour, grains and legumes. Are the basic food safety rules for these foods being followed? Fill in the work sheet with your observations and suggestions.

Foods such as flour, salt, sugar, legumes, grains, seeds are...	Yes	No	Suggestions for improvement
...kept in dry, clean places free from insects and animals	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...containers and sacks are kept off the ground and covered with a cover or a cloth	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...containers are suitable for foods and used only for this purpose	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...containers are clean and have no holes	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...the scoop is clean and used only for that product	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...the packages are whole, have no cracks, tears and holes	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...there are no signs of dirt, mould or moisture on the packages	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...the expiry date or sell-by date on the packages is not past	<input type="checkbox"/>	<input type="checkbox"/>	..... .....



# Food safety inspection – fresh, perishable foods



Visit a local market, grocery store or street stall and observe the conditions for fresh foods such as milk, meat, eggs and fish. Are the basic food safety rules for these foods being followed? Fill in the work sheet with your observations and suggestions

Foods such as milk, raw meats, eggs are...	Yes	No	Suggestions for improvement
...kept refrigerated	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...stored separated by product type	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...unpackaged foods are sold in the area used exclusively for that food item	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...containers and area are kept clean and covered	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...the dispenser is clean and used only for that food item	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...packaged foods are intact, the packages are free from cracks, tears and holes	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...there are no signs of dirt, mould or moisture on the packages	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
...the expiration date or sell-by date on the packages is not past	<input type="checkbox"/>	<input type="checkbox"/>	..... .....



# Recognizing the signs of poor quality foods

## Food

## Signs of poor quality

Cereals and other dry foods

Presence of insects, dirt, stones or other objects in the product.  
Product is wet, damp, or has spots of colour or mould.  
Change in appearance of product, such as lumps in flour or wrinkles in legumes.  
Bag or package is open, torn or broken.  
In packaged products, the expiry date or best-by date has passed.

Roots

Product is soft, not firm, or has sprouts.  
Has bruises, rotten spots or other signs of damage or spoilage.

Vegetables and fruits

Show signs of general softness or wilting, soft spots, rotten spots or other kinds of damage spots.

Meat and poultry

Have a bad smell or strange colour. In meats, liver and other organs: strong smell or unusual colour.

Fish

Bad smell. Soft flesh, instead of firm. Dull eyes; dry, dull and loose scales, gills or fins.

Eggs

To test an egg for freshness:  
Wash the egg in clean water and throw away the wash water.  
Gently place the clean egg (without dropping it) in a large bowl of clean water. If the egg sinks on its side to the bottom, it is fresh. If the egg floats instead of sinking, it is not good and should be thrown away.

Milk and milk products

Product has a bad smell, unusual taste or has been exposed to dirt, flies or other insects.  
Products needing refrigeration or cool temperatures that have not been kept adequately cool may be spoiled.  
In packaged products, the expiry date or best-by date has passed.

Canned foods

Can is swollen, bulging, dented, rusty or has other signs of damage inside or outside.  
Food has leaked out of the can.  
When the can is opened, food looks, smells or tastes bad.  
The expiry date or best-by date has passed.



You will need to use this to complete the Work sheet *Recognizing signs of good or spoiled food*

Use this as a guide to see if food is spoiled at home or in the shops.

# Recognizing the signs of good or spoiled foods

**How do you know if food is safe to eat?  
See if you can tell which foods are safe or unsafe.**

	Safe	Unsafe
1. A jar of tomato sauce is leaking.	<input type="checkbox"/>	<input type="checkbox"/>
2. The potato is soft with sprouts.	<input type="checkbox"/>	<input type="checkbox"/>
3. There is mould in a canned product.	<input type="checkbox"/>	<input type="checkbox"/>
4. The egg does not sink to the bottom, but floats in a bowl of water.	<input type="checkbox"/>	<input type="checkbox"/>
5. Bread is freshly baked, hot and just from the oven.	<input type="checkbox"/>	<input type="checkbox"/>
6. Meat looks grayish and has an unpleasant smell.	<input type="checkbox"/>	<input type="checkbox"/>
7. The package of biscuits is damp.	<input type="checkbox"/>	<input type="checkbox"/>
8. Nothing has leaked from the can.	<input type="checkbox"/>	<input type="checkbox"/>
9. Milk smells sour and has lumps in it.	<input type="checkbox"/>	<input type="checkbox"/>
10. Liquid spurts out when the jar is opened.	<input type="checkbox"/>	<input type="checkbox"/>
11. The use-by date has passed.	<input type="checkbox"/>	<input type="checkbox"/>
12. When you open a can, the food looks, smells and tastes good.	<input type="checkbox"/>	<input type="checkbox"/>
13. Mould is growing on the orange.	<input type="checkbox"/>	<input type="checkbox"/>
14. Jar lid is firmly sealed and curved inward.	<input type="checkbox"/>	<input type="checkbox"/>



	Safe	Unsafe
15. The flour is dry and has no lumps in it.	<input type="checkbox"/>	<input type="checkbox"/>
16. The can shows signs of rust.	<input type="checkbox"/>	<input type="checkbox"/>
17. The fish has a fresh smell of the ocean, bright eyes, firm flesh, bright colour scales and gills.	<input type="checkbox"/>	<input type="checkbox"/>
18. The tomato is soft, dull and faded, has soft and rotten spots.	<input type="checkbox"/>	<input type="checkbox"/>
19. The can is swollen, bulging.	<input type="checkbox"/>	<input type="checkbox"/>
20. The box of rice has holes in it.	<input type="checkbox"/>	<input type="checkbox"/>
21. Onions are soft and have yellow sprouts.	<input type="checkbox"/>	<input type="checkbox"/>
22. Green leafy vegetables are green, crispy and fresh.	<input type="checkbox"/>	<input type="checkbox"/>

Continue this list with your own examples of commonly eaten foods.



Answer key: 1 unsafe, 2 unsafe, 3 unsafe, 4 unsafe, 5 safe, 6 unsafe, 7 unsafe, 8 safe, 9 unsafe, 10 unsafe, 11 unsafe, 12 safe, 13 unsafe, 14 safe, 15 safe, 16 unsafe, 17 safe, 18 unsafe, 19 safe, 20 unsafe, 21 unsafe, 22 safe

# School canteen inspection

Carry out an inspection of your school canteen or cafeteria. Record your observations and suggestions on the work sheet. Present the findings of your inspection to the school.



	Yes	No	Suggestions
<b>Food handlers</b>			
• wear clean clothing	<input type="checkbox"/>	<input type="checkbox"/>	.....
• tie their hair back or cover it with a hat	<input type="checkbox"/>	<input type="checkbox"/>	.....
• wash their hands with clean water and soap	<input type="checkbox"/>	<input type="checkbox"/>	.....
• sneeze and cough on food	<input type="checkbox"/>	<input type="checkbox"/>	.....
• the same person who handles your food also deals with the money.	<input type="checkbox"/>	<input type="checkbox"/>	.....
<b>Cleanliness of your school canteen</b>			
• the canteen is kept clean	<input type="checkbox"/>	<input type="checkbox"/>	.....
• safe drinking water is always available	<input type="checkbox"/>	<input type="checkbox"/>	.....
• there is a clean bathroom	<input type="checkbox"/>	<input type="checkbox"/>	.....
• rubbish is kept in a covered bin	<input type="checkbox"/>	<input type="checkbox"/>	.....
• the bin is emptied frequently	<input type="checkbox"/>	<input type="checkbox"/>	.....
<b>Food preparation</b>			
• food preparation surfaces and utensils are clean	<input type="checkbox"/>	<input type="checkbox"/>	.....
• clean, carefully washed pans and utensils are used to prepare food	<input type="checkbox"/>	<input type="checkbox"/>	.....
<b>Serving food</b>			
• display areas are kept clean	<input type="checkbox"/>	<input type="checkbox"/>	.....
• clean plates and utensils are used to serve food	<input type="checkbox"/>	<input type="checkbox"/>	.....
• plates and utensils are protected from flies and dust	<input type="checkbox"/>	<input type="checkbox"/>	.....
<b>Food storage</b>			
• food shelves are kept clean	<input type="checkbox"/>	<input type="checkbox"/>	.....
• foods are stored in clean, covered containers	<input type="checkbox"/>	<input type="checkbox"/>	.....
• foods that need refrigeration are kept cold	<input type="checkbox"/>	<input type="checkbox"/>	.....
• frozen foods are kept frozen	<input type="checkbox"/>	<input type="checkbox"/>	.....



# Prepare and cook food properly

When preparing or cooking food,  
always be sure to...

- **Use clean water** to prepare and cook foods.
- Keep the **kitchen clean**. Use hot, soapy water to clean all kitchen surfaces.
- **Wash hands** well with soap and clean water before working with food and before eating.
- **Avoid drinking, smoking and eating** while preparing and cooking food. Also avoid sneezing or coughing on food and scratching or touching the head and body.
- Keep food preparation **surfaces and utensils clean**. Prepare food on a clean surface such as a table. Use clean, carefully washed dishes and utensils to store, prepare, serve and eat food.
- **Wash pots, bowls, dishes** and utensils (knives, spoons, forks) **immediately after use** and store in a clean place protected from flies and dust.
- **Cover all foods** to keep flies, dust and dirt away.
- **Wash well** with hot water and soap **all surfaces** touched by **raw animal foods**.
- **Prevent raw meat**, offal, poultry and fish **from touching other foods**, as these foods when raw or uncooked often contain harmful germs that can be passed on to other foods.
- **Cook animal foods** well to kill harmful germs.
- **Wash vegetables and fruits** with clean water. Peel if possible.
- **Boil eggs** so they are hard. Do not eat raw or cracked eggs.
- **Boil milk** unless it is from a safe source or already pasteurized.
- **Do not taste** food that you think may be **spoiled**.
- **Throw out foods** with **bad odours**, but be aware that many harmful germs in foods are odourless and tasteless.
- **Throw out foods** that **are mouldy**, rotting or have an unusual colour or smell.
- Keep **rubbish** in a **covered** bin and empty frequently.



★ You can copy this and keep it handy in your kitchen or cooking area.

★ This will help you complete the Work sheet **Tips on how to preserve nutrients in foods**

# Store food properly

When putting away and storing foods,  
always remember that...

- **All foods** should be **stored in clean, closed containers** off the ground and protected from moisture to avoid contamination by pests and mould. Food that becomes mouldy in storage is highly toxic and should never be eaten or fed to animals.
- Foods that have become discoloured, mouldy, or decayed or that have been contaminated by insects or rodents should be **thrown away**.
- **Food containers** should be used **exclusively for food** and should never be used for storing other substances.
- **Disposable containers** should **never be reused**.
- Store **raw food**, especially meat, **away from cooked foods**.
- **Meat, fish and milk** should be stored for only a few days and must always be **kept cool or refrigerated** to prevent dangerous spoilage.
- **Eggs** should be kept cool and refrigerated in unbroken shells, and in closed containers, if possible. Properly stored eggs can be kept for several weeks.
- **Fresh fruits and vegetables** should be stored at cool temperatures or refrigerated. They should be kept only for short periods of time, as they start to lose nutrients immediately after picking or harvesting. Soft fruits like peaches and leafy vegetables like lettuce and greens are especially fragile and spoil more quickly.
- **Roots and tubers**, such as potatoes, yams, cassava and taro, can be stored for several months if they are kept in a dark, cool, dry place away from insects or rodents.
- **Grains and legumes**, such as rice, flour and beans, kept in clean, tightly closed, dry containers can be stored for long periods of time.
- **Cooked food** should not be kept for more than two hours without being in a very hot or very cool place, or refrigerated. Cooked food should be stored in **clean, tightly closed, clearly marked food containers**.
- Cooked foods should be kept hot or consumed in a short period of time (one to two hours); if not, they **should be refrigerated**.
- **Leftover** cooked foods should be **reheated thoroughly** until very hot before eating and should be **kept covered** and refrigerated for no more than 1-2 days.
- **Foods like sliced**, processed meats should be **kept cool** and should not be left out for more than two hours.



★ This will help you complete  
the Work sheet Tips on how to preserve  
nutrients in foods

★ You can copy this and  
keep it handy at home  
where you store foods.

# Tips on how to preserve nutrients in foods

1. Cook and eat vegetables
2. Avoid overcooking
3. Choose vegetables
4. Do not prepare and cut vegetables
5. Do not leave vegetables
6. Add the meat, fish or vegetable broth
7. Cook or steam vegetables with
8. To help absorption of iron
9. To improve absorption of vitamin A

- A. soaked in water or exposed to the air.
- B. the same day you buy or pick them.
- C. serve orange vegetables, like carrots, pumpkin and squash with some fat.
- D. which destroys nutrients.
- E. as little water as possible.
- F. at their peak of ripeness.
- G. to sauces or soups.
- H. in advance, do it right before eating.
- I. prepare leafy green vegetables with vitamin C-rich foods.



Answer key: 1B, 2D, 3E, 4H, 5A, 6G, 7E, 8I, 9C

**Do you know how to avoid losing nutrients when cooking and preparing food? Test your knowledge by matching the beginning of the each sentence on the left with its correct ending on the right.**

# Household food safety inspection

**Can your home pass a food safety inspection?  
Inspect the areas where you cook and store food in your home.  
Record your findings and observations on the work sheet.  
See how you can improve food safety in your home.**

Is your home well organized for food storage?	Yes	No	Suggestions for improvement
Are there special areas for food items?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Are there any unsafe places of food storage?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you wash your hands with soap and hot water before and after touching food?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you change dirty cloths and kitchen towels frequently?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you direct your sneezes away from the food and wash your hands afterwards?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you wash cutting boards, knives, tables, plates and other utensils with soap and hot water after use, especially with raw meat, fish, poultry and eggs?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....





Is your home well organized for food storage?	Yes	No	Suggestions for improvement
Do you cook meat, fish, poultry thoroughly?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you keep perishable foods adequately cool?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you keep your kitchen counter, table, fridge and utensils clean and remove the spills immediately after they happen?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do you serve foods on clean plates and store them in clean containers?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....
Do pets (cats, dogs, etc) jump and walk on your kitchen table, fridge, cupboards?	<input type="checkbox"/>	<input type="checkbox"/>	..... .....





# Jumbled foods

Unjumble the foods listed in the left column of the work sheet and write the name of the food in the second column.

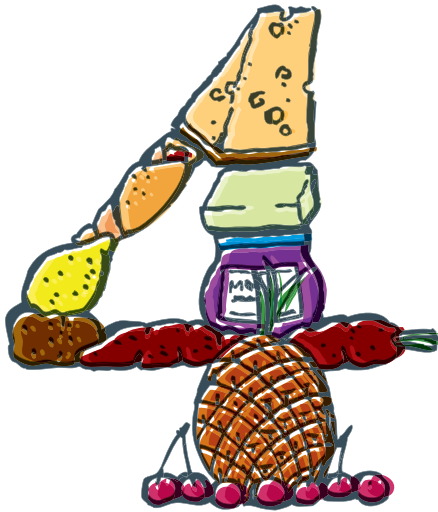
Then, for each food, record in the appropriate column the type of container, best storage place and temperature for that food to keep it fresh and safe.

Jumbled food	Unjumbled food	Type of container	Storage place	Temperature
ATEM	.....	.....	.....	.....
KIML	.....	.....	.....	.....
RULOF	.....	.....	.....	.....
OTPOTA	.....	.....	.....	.....
ERCI	.....	.....	.....	.....
SLINETL	.....	.....	.....	.....
SIHF	.....	.....	.....	.....
OMTOTA	.....	.....	.....	.....
ESHECE	.....	.....	.....	.....



Answer Key: meat, milk, flour, potato, lentils, fish, tomato, cheese, rice

# Healthful habits and lifestyles



Healthful habits and lifestyles is about how body weight, physical activity, good personal hygiene and clean surroundings affect our health. It explores what a healthy body size is and how to achieve a healthy weight by keeping energy in balance. It discusses the importance of physical activity and fitness for good health and weight. It explains how protecting ourselves from germs that cause disease is an important part of keeping well and healthy.



**Lesson 9**  
Achieving healthy body size and weight



**Lesson 10**  
Keeping fit and active



**Lesson 11**  
Keeping ourselves, our water and our surroundings clean





### LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- explain the connection between the energy the body gets from foods and the energy it uses for normal body processes and activity;
- discuss different cultural attitudes and perceptions about body size;
- use standard tools for measuring child growth and adult body weight.

### Lesson 9

# Achieving healthy body size and weight

### LESSON OVERVIEW



This lesson is about achieving and maintaining the right body size and weight for good health. It discusses how attitudes and perceptions of an “ideal” body size vary from one culture to another and explains that the best body size for good health is neither too thin nor too fat. It explains that to keep a healthy body weight, the calories we consume from foods and beverages need to be in balance with the calories we need for normal body functions, daily movements and physical activity. Simple, standardized tools are presented to measure, evaluate and monitor body weight for adults and children.

**Part 1**

# Achieving and maintaining a healthy body size



## READING

People have different attitudes and perceptions about body size. The way people think of or perceive body size differs from culture to culture. Some cultures see a plump body and weight gain as a symbol of beauty, health and wealth, while others see excessive thinness as a beautiful and “ideal” body size. In other cultures, thinness is considered a sign of illness or poor health. These perceptions can lead to poor diets and eating habits because they are based on issues other than health and nutrition. In fact, good health for most people depends on a body size that is neither too fat nor too thin. Both extreme fatness and extreme thinness represent poor health and can put us at risk of disease. The ideal body size for good health is in the middle.

Desirable body weight is related to age and sex, as well as to height. For example, men tend to have a larger bone structure and greater muscle mass than women, and therefore, men are generally heavier than women of the same height. Overall, it is best to achieve and maintain a good body weight and avoid extremes of either weight gain or weight loss.

Food is stored in the body in the form of fat that can be used for energy during periods when food is not available. A calorie is defined as a unit of energy supplied by food. This ability to store calories is very important to our survival in times of hunger and low food availability, such as during the hungry season between harvests, food shortages, emergencies and during illness. However, the ability to store fat puts people at risk of overweight and obesity if they do not adjust their food intake according to their needs.

The calories consumed from foods need to be balanced by the calories used in normal body functions, daily activities and physical activity. Using more energy than we take in from food (negative energy balance) over several months or longer can lead to significant weight loss and, in some cases, undernourishment. This is what happens when people continually do not have enough food to eat. This also happens when people intentionally reduce their food intake in order to lose weight. Taking in more food energy than we expend (positive energy balance) over time can lead to significant weight gain. To gain weight, we need to consume more than we use, and to lose weight we need to use more than we consume. To maintain a healthy body weight, we need to balance the energy we take in from the food we eat with the energy that we use.

### TO THINK ABOUT WHILE READING



How do we evaluate body size?

What is meant by good body size?

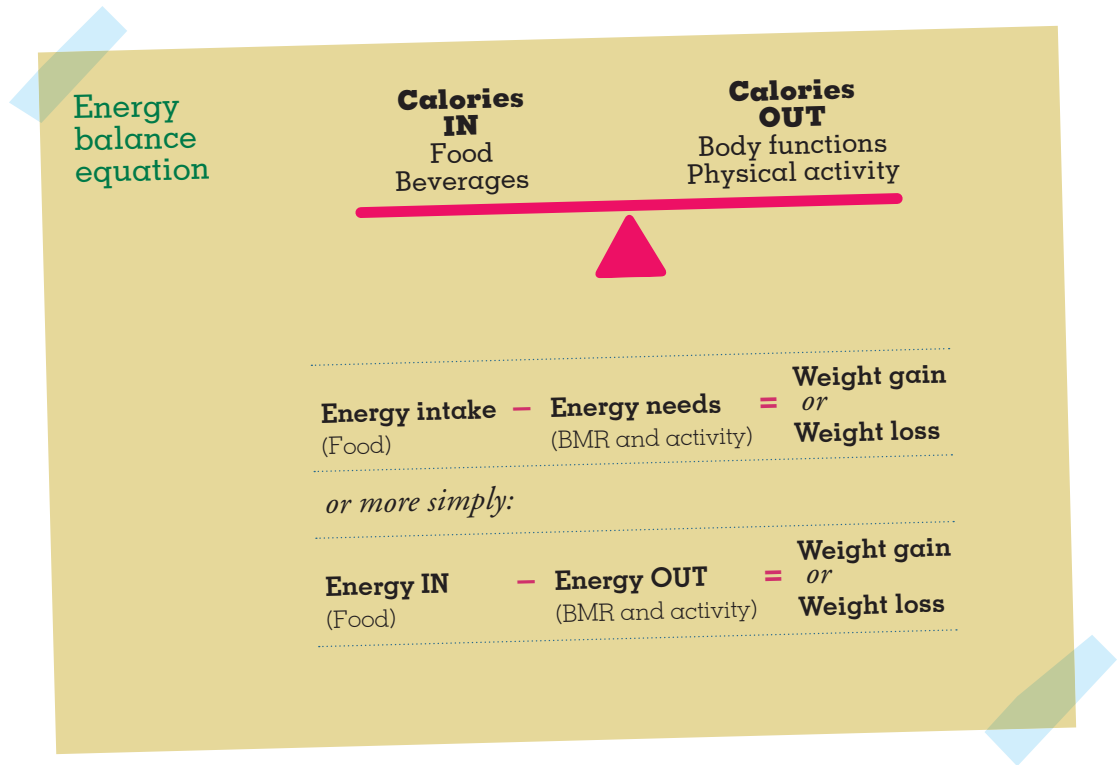
How do we maintain a healthy body weight?



We need energy for our body processes, called **Basal Metabolic Rate (BMR)**. These processes include the energy that it takes for our heart to beat, for our lungs to breathe in and out, for digestion, for our brain to think and coordinate other parts of the body, for growth, and for our cells to metabolize our food. In addition to these essential body processes, we need energy for all of the activities we do throughout the day.

**Individual energy needs vary widely.** The amount of energy needed to maintain a healthy body weight depends on a person’s age, sex, physiological condition and activity level. Whether a person needs to gain weight, lose weight or maintain a healthy weight, it is important to understand the connection between the energy the body takes in through the foods and beverages consumed and the energy the body uses through normal body functions, daily activities and physical activity.

In order for energy to be in balance, the energy taken in needs to equal the energy used. We can think of this as the “Energy Balance Equation”. This means we need to balance the amount of food we eat (in terms of calories) with how much we use up in normal body processes (BMR) and activity. We need more food energy to do vigorous physical activities such as heavy field work or gardening, carrying water, doing heavy household jobs or playing active sports. We need less food energy to do light activities such as reading, sitting or doing office work. The amount of energy we use in an activity also depends on how long we do the activity.





---

<b>If you are...</b>	<b>your energy status is...</b>
<b>...maintaining your weight</b>	<b>...in balance.</b> You are eating about the same number of calories that your body is using. If you continue to stay in balance, your weight will remain the same.
<b>...gaining weight</b>	<b>...in calorie excess.</b> You are eating more calories than your body is using. Your body is storing these extra calories as fat, so you are gaining weight.
<b>...losing weight</b>	<b>...in calorie deficit.</b> You are eating fewer calories than you are using. Your body is using its fat stores for the energy it needs, so you are losing weight.

---

*Adapted from the CDC "Healthy Weight"*

While many quick weight loss "diets" are popularly promoted, quick weight loss has been found to be harmful to the body. Most products that claim to "burn fat" are either ineffective or have dangerous side effects that could cause serious illness and even death. It is important that people who are reducing their food consumption in order to lose weight choose nourishing foods that ensure adequate vitamins and minerals while they are losing weight. The very best advice is gradual weight loss by limiting high calorie foods, increasing consumption of lower calorie fruits and vegetables, controlling portion sizes and increasing activity levels. Not only is this advice the most successful for weight control, it is excellent advice for all-round health and fitness.

The two most common methods of evaluating body weight (body fatness or body leanness) are the "Body Mass Index" (BMI) for adults and the weight-for-height and weight-for-age indices for children. The BMI considers the person's weight in relation to their height and is calculated by dividing their weight in kilograms by the square of their height in metres. BMI is easy to measure and provides an indication of normal weight, overweight or underweight for an adult individual. BMI does not consider body composition (amount of muscle, fat, bone weight or frame size) and therefore it may not correctly categorize very muscular people or children. Separate tables are used for interpreting BMI for adults and children.

For children and adolescents, whose bodies are constantly changing and growing, standard growth charts and tables are commonly used to evaluate their growth compared to other children of the same age and sex. Most countries use the standard charts developed by the World Health Organization (WHO),













although some countries have developed their own, based on the WHO charts. Babies and children need to be weighed and measured regularly and accurately to assess their growth and nutritional status. Regular growth monitoring is important for identifying any growth problems early and for correcting them before related health problems arise. Separate charts are used for males and females and for specific age groups. The four most commonly used charts for evaluating a child's growth are: length/height-for-age; weight-for-age; weight-for-length/height; BMI for age.



**More detailed instructions** on how to weigh and measure infants and children and on growth charts can be found at:  
[http://www.who.int/childgrowth/standards/weight\\_for\\_height/index.html](http://www.who.int/childgrowth/standards/weight_for_height/index.html)





### MATERIALS

-  Fact sheet *How is BMI calculated and interpreted?*
-  Work sheet *Calculating and evaluating adult body size*
-  Example work sheet *Child BMI and growth charts*
-  Work sheet *Evaluating children's growth and weight*
-  Work sheet *Fill in the gaps*
-  Ask yourself work sheet *Calculating energy balance*
-  Answer work sheet *Calculating energy balance*
-  Fact sheet *Energy balance equation*



### ACTIVITIES

## Calculating and evaluating adult body size

-  Using the Fact sheet *How is BMI calculated and interpreted?* review the equation and copy it in your notebooks or on the board.
-  Go to the Work sheet *Calculating and evaluating adult body size* and calculate the BMI of the people listed. Decide which weight group they fit in. Are they at a healthy weight or not?  
*Discuss:* Is BMI a perfect way to measure weight and body size, or are there certain situations where it would be inaccurate?



## Evaluating children's growth and weight



Print out the Example work sheet *Child BMI and growth charts*, or draw on the board or on a large sheet of paper a simplified version of the charts. Find the important child information on the chart and review the process of plotting a child's height, weight and age.



Go to Work sheet *Evaluating children's growth and weight*. For each child, choose the correct growth chart and plot their age, weight and height on the chart. Evaluate their growth to determine whether they are in the normal range or not.

## What do people think about body size?

Using the Internet, art, books, magazines or other sources of information, find out what people from different countries, regions and societies around the world think is a good body size for women and men. How should a person's "ideal" body size be? What are the different perceptions and attitudes toward a thin body? What are the different perceptions and attitudes toward a plump body?

Draw or find a picture of how a woman with a beautiful body would look in that society.

Draw or find a picture of how a man with an attractive body size would look in that society.

*If you are working as a class*, have a discussion of body size based on the questions below.

*If you are working individually*, see if you can answer these questions:

- How different are these ideals from the body size perceptions in your community?
- Why do different cultures think differently about body size?
- What forms people's opinion of an ideal body size?
- What body size is considered good, beautiful or powerful in your community?
- Are these ideals the same for men and women? For boys and girls?
- Do you think these idealized body sizes and shapes are healthy?
- Could there be any negative consequences of these culturally imposed body sizes?
- Are these body sizes always achievable for most people?
- What problems are caused by an ideal that most people cannot achieve?
- How are young people affected by unrealistic values?
- Have ideas about good body size changed over time in your society? If so, how? What has caused these changes?



## Body size and mass media

Look in the popular media for images of body sizes and shapes of males and females of a variety of ages. Suggestions of media include: advertisements in magazines, TV, newspapers, billboards and other forms of publicity. Compare and contrast the ways the female and the male body size and activities are portrayed in the media.

*If you are working as a group*, bring into class some examples or written descriptions of these images, share with others and discuss the following questions.

*If you are working individually*, see if you can answer them.

1. How are females of all ages represented in terms of their body size and shape?
2. Do these representations seem to be an accurate portrayal?
3. What activities are they engaged in?
4. How are males of all ages represented in terms of their body size and shape?
5. Do these representations seem to be an accurate portrayal?
6. What activities are they engaged in?
7. What differences in body size and shape are there in how females and males of various ages are portrayed?
8. What differences are seen in the activities that females and males of various ages are engaged in?
9. Do you think these images are consistent with appropriate health and nutrition messages?
10. If not, what suggestions would you make for more appropriate media portrayal of messages?

## Achieving energy balance



Go to the Work sheet *Fill in the gaps* and complete the sentences to check your understanding of the energy balance.

## Calculating energy balance



Read about Henry, Irene and Marie on the Ask yourself work sheet

*Calculating energy balance*. For each one, calculate their energy expenditure by adding calories burned through BMR and activities. Then, compare this number to the amount of calories consumed. Determine whether each person is likely to lose weight, gain weight or remain at a constant weight if they continue this lifestyle. Make recommendations for improving each situation. Check your answers and recommendations with the Answer work sheet *Calculating energy balance*.





## Healthful ways to control weight

Think about what kinds of things people often do to lose weight. Write your ideas on the board. Some of your responses may be healthful and some less healthful.

Compare them to the recommended weight control strategies, which include:

- gradual weight loss through limiting high calorie foods
- increasing consumption of lower calorie fruits and vegetables
- control of portion sizes
- increasing activity levels.

*Discuss:* What are the dangers of quick weight loss diets?

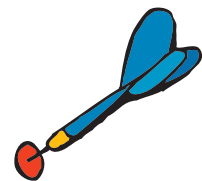


### KEY POINTS

**Review these three key points** to remember about how to achieve and maintain the best body size for good health. Reflect on your perceptions of body size and evaluate your own body weight.

### A healthy body size and weight

- Using more energy (calories) than we get from food can result in weight loss. Taking in more calories than we use through body processes and daily activities can lead to weight gain.
- To maintain a healthy weight, we need to keep our energy in balance. The best way to control weight is to limit high calorie foods, increase consumption of fruits and vegetables, control portion sizes and increase activity levels.
- Different cultures and people have different perceptions of the “ideal” body size. The best body size for good health is in the middle - neither too fat nor too thin.



# How is BMI calculated and interpreted?

**BMI** is calculated the same way for both adults and children. For adults 20 years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women. For children and teenagers, BMI is interpreted by age and sex.

The BMI calculation is based on the following formulas:

Measurement units	Formula and calculation
Kilograms and metres (or centimeters)	<p><b>Formula:</b> <math>\text{weight (kg)} / [\text{height (m)}]^2</math></p> <p>With the metric system, the formula for BMI is weight in kilograms divided by height in metres squared. Since height is commonly measured in centimetres, divide height in centimetres by 100 to obtain height in metres.</p> <p><i>Example: Weight = 68 kg, Height = 165 cm (1.65 m)</i>  <i>Calculation: <math>68 \div (1.65)^2 = 24.98</math></i></p>
Pounds and inches	<p><b>Formula:</b> <math>\text{weight (lb)} / [\text{height (in)}]^2 \times 703</math></p> <p>Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703.</p> <p><i>Example: Weight = 150 lbs, Height = 5'5" (65")</i>  <i>Calculation: <math>[150 \div (65)^2] \times 703 = 24.96</math></i></p>

The standard weight status categories associated with BMI ranges for adults are shown in the following table.

BMI	Weight status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese



★ This will help you calculate and evaluate your own Body Mass Index (BMI)

★ You will need to use this to complete the Work sheet Calculating and evaluating adult body size



# Calculating and evaluating adult body size

1. Ben weighs 90 kg and is 2 m tall.
2. Robert weighs 100 kg and is 1.6 m tall.
3. Sara weighs 50 kg and is 1.6 m tall.
4. Maria weighs 65 kg and is 1.5 m tall.
5. Walid weighs 45 kg and is 1.7 m tall.
6. Paul weighs 125 kg and is 1.85 m tall.
7. Olga weighs 49 kg and is 1.55 m tall.
8. Chun weighs 82 kg and is 1.7 m tall.
9. Felicity weighs 41 kg and is 1.62 m tall.
10. Stephen weighs 82 kg and is 1.9 m tall.
11. Milagros weighs 64 kg and is 1.68 m tall.
12. Sandra weighs 74 kg and is 1.65 m tall.

Calculate the **BMI** of each of these people. Then, for each one, **evaluate their weight status**. Are they underweight, normal weight, overweight or obese (very overweight)? **Compare the results** with the answers provided. **Create additional examples** if more practice is needed.

**Answer key:** 1 BMI = 22.5 Normal weight; 2 BMI = 39.0 Obese; 3 BMI = 19.5 Normal weight; 4 BMI = 28.8 Overweight; 5 BMI = 15.6 Underweight; 6 BMI = 36.5 Obese; 7 BMI = 20.4 Normal weight; 8 BMI = 28.4 Overweight; 9 BMI = 15.6 Underweight; 10 BMI = 22.7 Normal weight; 11 BMI = 22.7 Normal weight; 12 BMI = 27.2 Overweight

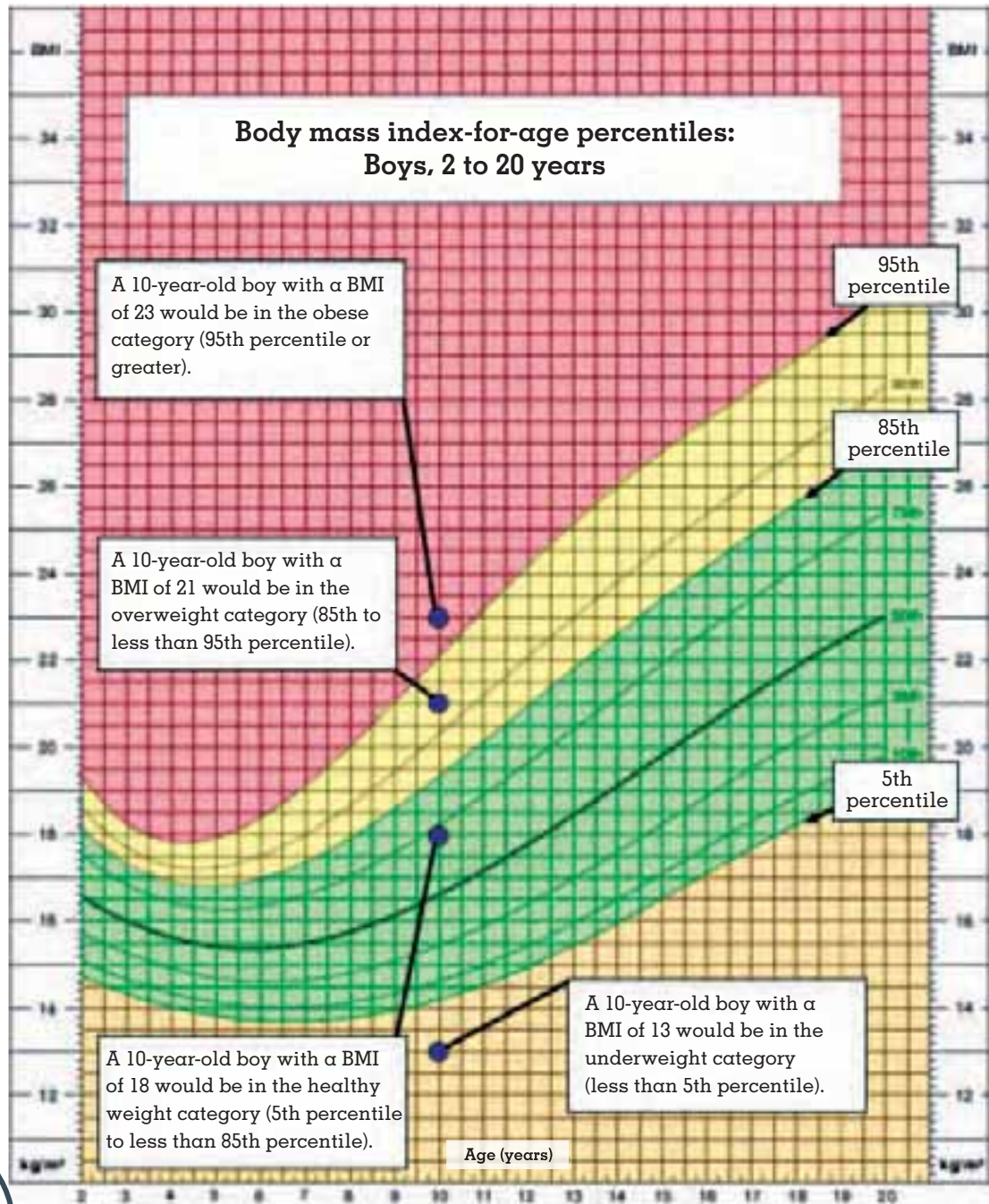


You can create more examples or calculate the BMI of people you know.

# Child BMI and growth charts

Review these examples to see if you understand how to evaluate BMI for children.

Child BMI sample chart



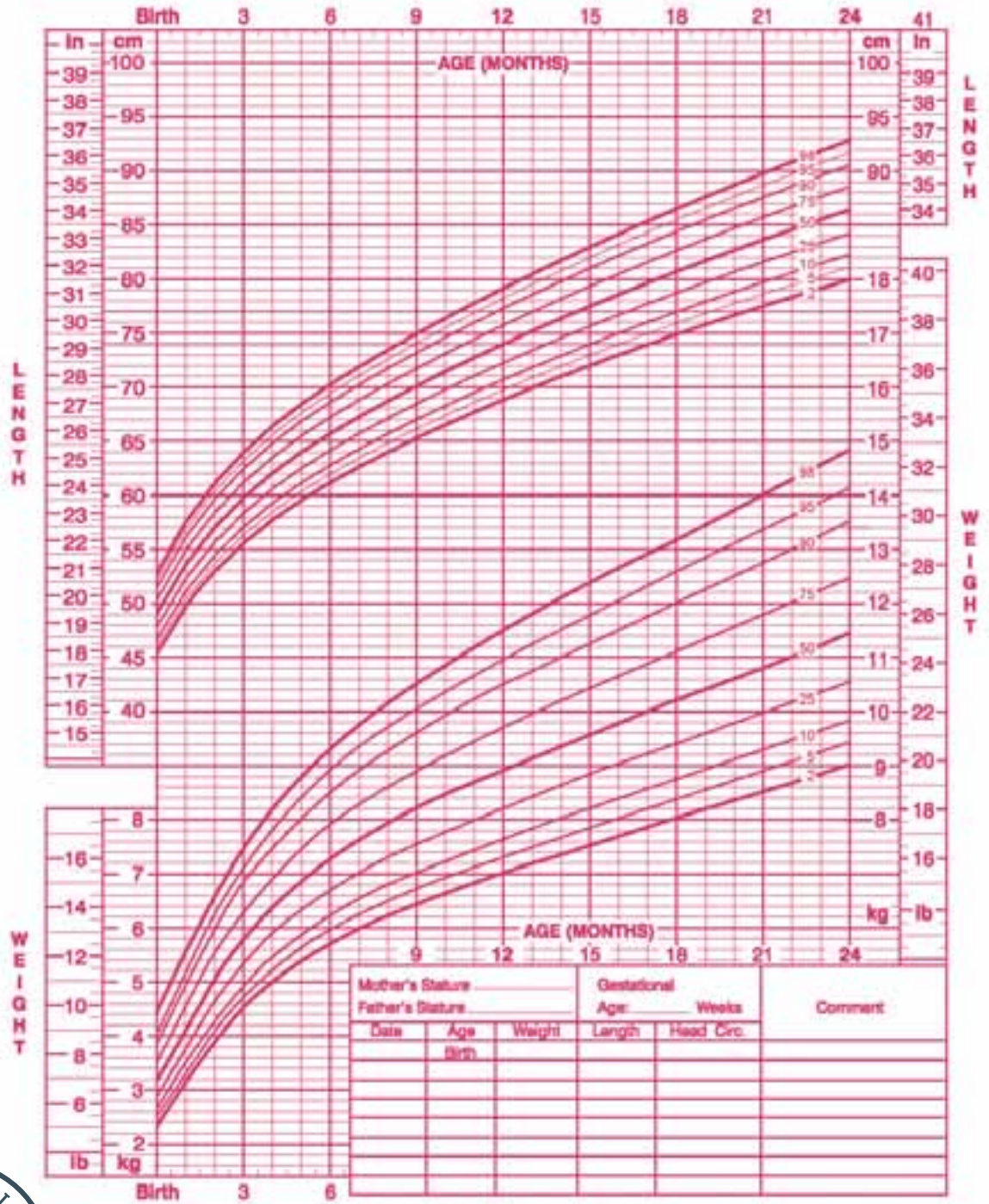
**This is the standard chart used to record and evaluate the growth of baby girls up to 24 months old.**

**Growth chart girls birth-24 months**

Name .....

Length-for-age and weight-for-age percentiles

Record .....



Published by the Centers for Disease Control and Prevention, November 1, 2009  
SOURCE: WHO Child Growth Standards (<http://www.who.int/childgrowth/>)





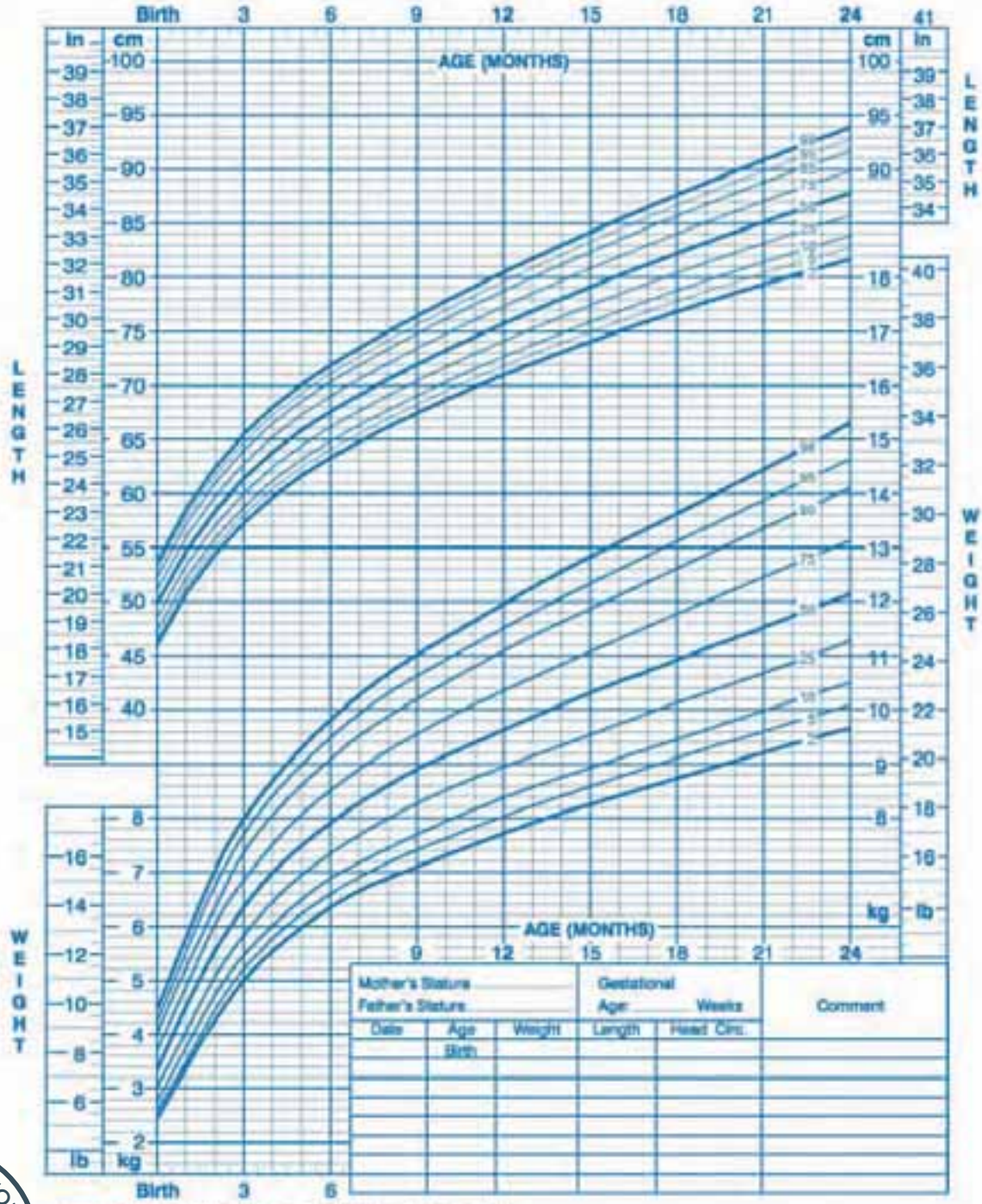
This is the standard chart used to record and evaluate the growth of baby boys up to 24 months old.

Growth chart **boys** birth-24 months

Name .....

Length-for-age and weight-for-age percentiles

Record .....



Published by the Centers for Disease Control and Prevention, November 1, 2003  
SOURCE: WHO Child Growth Standards, <http://www.who.int/childgrowth/>





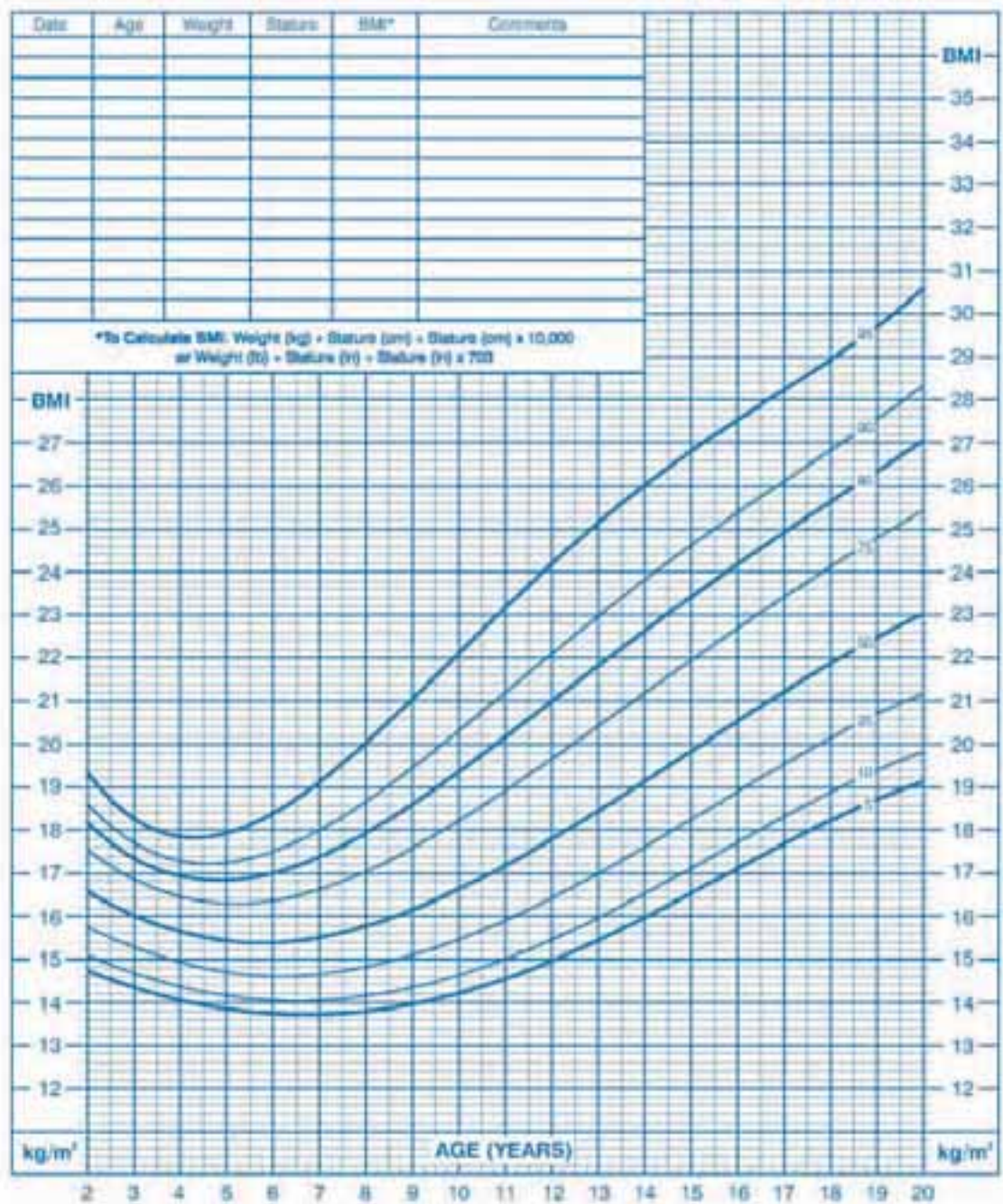
This chart is used to record and evaluate the BMI of boys between 2 and 20 years old.

BMI chart **boys 2-20 years**

Name .....

Body mass index-for-age percentiles

Record .....



Published May 20, 2000 (revised 10/2002)  
SOURCE: Developed by the National Center for Health Statistics in collaboration with  
the National Center for Chronic Disease Prevention and Health Promotion (2002)  
<http://www.cdc.gov/growthcharts>





# Evaluating children's growth and weight

For each of the 4 examples below, choose the appropriate chart to record and evaluate the child's growth and weight.

Is the child in the normal range, likely to be too thin or likely to be too heavy?  
Do any of them have serious growth problems?

1. **Sam** is 4 years old. He weighs 22 kg and is 115 cm tall. Determine Sam's growth status by finding his percentile on the chart and evaluate whether or not he is in the normal range.
2. **Sara** is 2 years old. She weighs 11 kg and is 90 cm tall. Determine Sara's growth status by finding her percentile on the chart and evaluate whether or not she is in the normal range.
3. **Charity** is 3 years old and weighs 19 kg and is 102 cm tall. Determine Charity's growth status by finding her percentile on the chart and evaluate whether or not she is in the normal range.
4. **Paul** is 5 years old. He weighs 12 kg and 100 cm tall. Determine Paul's growth status by finding his percentile on the chart and evaluate whether or not he is in the normal range.

Answer key: 1 Sam is at the 80th percentile for his weight for his height, therefore he falls within normal range. This means that he is likely to be at a normal weight for his height.

2 Sara is at the 4th percentile, therefore she falls below normal range. This means that she is likely to be underweight for her height.

3 Charity is at the 95th percentile, therefore she is at the top of the overweight range. This means that she is likely to be borderline obese.

4 Paul is below the 3th percentile, therefore he is below the normal range. This means that he is likely to have serious growth problems.





# Fill in the gaps

Check your understanding of energy balance by choosing the correct word from the box to complete each sentence. Use each word once.

- a. obesity    b. gain    c. maintain    d. reducing    e. activities  
 f. loss    g. metabolize    h. age    i. out    j. increasing    k. in

- We need energy for our heart to beat, our lungs to breathe, our brain to think, our stomachs to digest and our cells to ..... food.
- We also need energy for all our daily ..... and physical movements.
- Our energy needs depend on our ..... sex, physiological condition and activity level.
- Taking in just the right amount of energy needed for body functions and daily activities helps us ..... healthy body weight.
- Taking in less energy than we need over time can lead to weight .....
- Taking in more energy than we need over time can lead to weight .....
- The ability of the body to store fat can protect us in times of hunger but can also put us at risk of .....
- Overweight and obesity can be prevented and treated by ..... calories consumed and ..... physical activity.
- Energy ..... *minus* Energy ..... *equals* Weight Gain or Weight Loss.



Answer key: 1: g; 2: e; 3: c; 4: d; 5: f; 6: i; 7: h; 8: a and j; 9: k and i.



# Calculating energy balance

## Are these people in energy balance?

For each example, calculate the person's energy expenditure by adding calories burned through BMR and daily activities. Compare this number to the amount of calories consumed (food energy intake).

Determine whether these people are likely to lose weight, gain weight or remain at a constant weight if they continue this lifestyle. Make recommendations for improving each situation.

**Henry** is 28 and works as a builder on a construction site. He weighs 89 kg and is 190 cm tall. Can you calculate his BMI?

Henry awakes at 5.30 every morning, gets ready for work and has a large breakfast. This usually takes 30 minutes, burning 70 calories. He then rides his bike to work for one hour, burning 300 calories. He works an 8-hour shift, burning 200 calories per hour and takes a short break mid-morning for a snack and something to drink. At work, he has one hour to rest and have a cooked lunch he brings from home; this burns 50 calories.

After work, he rides his bike home again for one hour, burning 300 calories. At home, he has a snack and spends an hour playing with his children, burning 150 calories and then helps them with their homework for an hour, burning 70 calories. The rest of the evening he relaxes with his family, reads the newspaper and has dinner; this burns 70 calories per hour. At 10.00 pm he goes to bed. He burns 53 calories per hour until he wakes up again.

We know that Henry:

- has a BMR of 2 045 calories per day
- burns at least 3 000 calories in daily activity
- consumes an average of 5 000 calories a day

1. What is Henry's overall energy balance? (BMR + calories burned from daily activity compared with calorie intake (food and beverages consumed))
2. Is he likely to gain weight, lose weight or maintain the same body weight if his food intake (calories) and activity level remain the same?
3. What advice would you give to Henry, taking into consideration his BMI and current energy balance status?



'BMR' is the amount of energy required for basic body functions.

The calculations used here are:

**Men:**  $(13.7 \times \text{wt in kg}) + (5 \times \text{ht in cm}) - (6.8 \times \text{age in years}) + 66$

**Women:**  $(9.6 \times \text{wt in kg}) + (1.8 \times \text{ht in cm}) - (4.7 \times \text{age in years}) + 655$

**BMI Formula:**  $\text{weight (kg)} / [\text{height (m)}]^2$

**Irene** is 19 and works as a radio DJ. She weighs 71 kg and is 161 cm tall.  
Can you calculate her BMI?

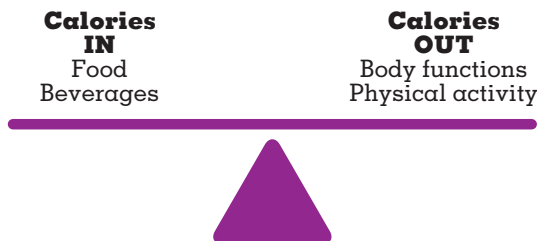
She gets up every morning at 6 am, eats breakfast and rushes out of her house so she can be on time for her morning radio programme which starts at 7 am. Her colleague who lives next door, gives her a lift to work every day; sitting in the car for 30 minutes burns about 30 calories. Irene’s radio programme lasts 4 hours starting at 7 am and finishing at 11 am, burning 70 calories per hour. She snacks and drinks various beverages throughout her programme. When her programme is finished, she works for two hours on her computer, updating the radio’s website and replying to emails. This burns 80 calories per hour. She takes a one-hour break to eat a big lunch, relaxing and talking with her colleagues; this burns 70 calories. After lunch she spends another 2 hours in the office, preparing her next programme, listening to music and looking for interesting stories about the latest music stars. This burns 80 calories per hour.

After work, Irene usually meets some friends for 2–3 hours to get something to eat for dinner; sometimes they go to a local pub or the cinema, burning 70 calories an hour. She goes to bed at around 11 o’clock. She burns 50 calories an hour until she wakes up again.

We know that Irene:

- has a B.M.R. of 1 537 calories per day
- burns at least 1 260 calories in daily activity
- consumes an average of 3 200 calories a day

1. What is Irene’s overall energy balance? (BMR + calories burned from daily activity compared with calorie intake (food and beverages consumed))
2. Is she likely to gain weight, lose weight or maintain the same body weight if her food intake (calories) and activity level remain the same?
3. What advice would you give Irene, taking into consideration her BMI and current energy balance status?



**Marie** is 35 and she is a farmer. She weighs 50 kg and is 168 cm tall.  
Can you calculate her BMI?

In the morning she awakes at 6 am, takes one hour to prepare breakfast for her family, do a few household chores and eats her own breakfast; this burns 120 calories. She then walks to her fields for half an hour, burning 130 calories. She ploughs, plants, weeds and digs for 6 hours each day. This burns 200 calories per hour. At noon she has a 2-hour break to have a little food and rest; this burns 70 calories per hour. When she has finished her work for the day, she walks home again (130 calories).

At home, she spends one and a half hours taking care of her chickens and preparing the evening meal for her family, burning 110 calories an hour. After dinner she spends some time with her husband and children, finishes her household chores (burning 120 calories) and goes to bed around 10.30 pm. She burns 50 calories an hour while she is sleeping.

We know that Marie:

- has a B.M.R. of 1 273 calories per day
- burns at least 2 380 calories in daily activity
- consumes an average of 1 800 calories a day

1. What is Marie's overall energy balance? (BMR + calories burned from daily activity compared with calorie intake (food and beverages consumed))
2. Is she likely to gain weight, lose weight or maintain the same body weight if her food intake (calories) and activity level remain the same?
3. What advice would you give Marie, taking into consideration her BMI and current energy balance status?

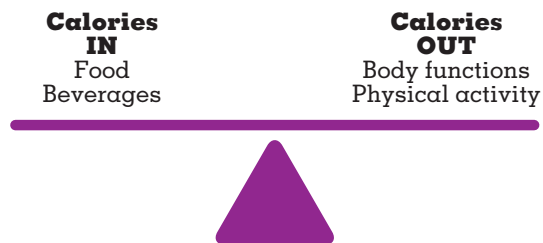


★ You can check your answers on Answer work sheet **Calculating energy balance**



# Calculating energy balance

Even though we do not have complete information on the total food intake, total daily expenditure (daily activities) or health status of Henry, Irene and Marie, we have enough information to make an approximate assessment of their **energy balance** and make **some reasonable observations and recommendations for each of them.**



## BMI Weight Status Categories

BMI	Weight status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

**Henry** has a BMI of 24.6, which puts him in the normal weight range. He is also in energy balance, because the calories he takes in are equal to the calories he uses for his normal body processes (BMR) and for daily movement and activities. If he continues his current pattern of eating and activity, he is likely to maintain his healthy body weight and BMI. However, Henry may need to be careful, because he is at the top of the normal weight range for his height and it will not take much for him to slip into the overweight category. If he eats only a little bit more each day or moves a little bit less, over time his weight and BMI will increase.



★ Use this Answer Work sheet to check your answers on the Ask yourself work sheet **Calculating Energy Balance**

**Irene** has a BMI of 27.4, which means that she is overweight. She is also in positive energy balance, because she is consuming more calories than she burns for her body processes (BMR) and for daily movement and activity. If she continues her current eating pattern and lack of physical activity, she will continue to gain weight. Irene has a job that requires many hours of sitting and she does not seem to be very physically active outside of work. To lose weight, Irene will need to reduce the amount of calories she consumes and find ways to increase her physical activity, such as walking part way or all the way to and from work, taking a short walk during her lunch break and doing some more vigorous activities after work or on the weekends. Being more physically active will also have many other health benefits for Irene.

**Marie** has a BMI of 17.7, which means that she is underweight. She is also in negative energy balance, because she is consuming fewer calories than she needs to cover her body processes (BMR) and her daily movement and activity. If she continues her current pattern of undereating and heavy physical labour and activity, she will continue to lose weight. Marie's health is at risk; as she continues to lose weight, she will become more underweight, she will be less able to fight infections and will become ill more easily and more seriously. She needs to immediately increase her food consumption. It would be good for her to see a health care professional and try to reduce her physical work load, if possible.

★ You can read more about the importance of physical activity for good health in Lesson 10 *Keeping fit and active*

★ You can read more about the health problems related to underweight and undernutrition in Lesson 3 *Understanding problems of poor nutrition*

★ You can read more about the health problems related to overweight and obesity in Lesson 3 *Understanding problems of poor nutrition*



# Energy balance equation

$$\begin{array}{rcl} \text{Energy intake} & - & \text{Energy needs} & = & \text{Weight gain} \\ \text{(Food)} & & \text{(BMR and activity)} & & \text{or} \\ & & & & \text{Weight Loss} \end{array}$$

*or more simply:*

$$\begin{array}{rcl} \text{Energy IN} & - & \text{Energy OUT} & = & \text{Weight gain} \\ \text{(Food)} & & \text{(BMR and activity)} & & \text{or} \\ & & & & \text{Weight Loss} \end{array}$$

**Calories IN**  
Food  
Beverages

**Calories OUT**  
Body functions  
Physical activity



**If you are...**

**Your energy status is...**

...maintaining your weight

...in balance.

You are eating about the same number of calories that your body is using. If you continue to stay in balance, your weight will remain the same.

...gaining weight

...in calorie excess.

You are eating more calories than your body is using. Your body is storing these extra calories as fat, so you are gaining weight.

...losing weight

...in calorie deficit.

You are eating fewer calories than you are using. Your body is using its fat stores for the energy it needs, so you are losing weight.

*Adapted from the CDC "Healthy Weight"*







### Lesson 10

# Keeping fit and active

## LEARNING OBJECTIVES



*By the end of the lesson, you will be able to:*

- appreciate the health benefits of regular physical activity and exercise;
- understand why we need to do different kinds of physical activity;
- evaluate your activity level and make a personal activity plan.

## LESSON OVERVIEW



This lesson is about the many ways in which being physically active and fit can help improve health. It explains how regular physical activity is important for everyone. It discusses some of the important health benefits of being active and fit, such as keeping a healthy body weight and lowering the risk of heart disease, diabetes and joint and bone diseases. The lesson also presents the health advantages of including a combination of different types of physical activity – aerobic, strengthening and stretching – into daily life. Examples are provided of light, moderate and vigorous activities for people to choose from. The lesson concludes by encouraging the development of personal physical activity plans.



## Part 1

# Being fit and active



### READING

Physical activity improves our health and can actually lower the risk of many serious diseases. One of the major benefits of regular physical activity is in controlling weight, which reduces the risk of cardiovascular diseases, diabetes and joint and bone diseases. Regular physical activity is important for everyone, not just for controlling weight, but also for improving heart, lung and muscle functions. It contributes to healthy bones, muscles and joints, increases flexibility and improves movement, helps to relieve the pain of arthritis, and is associated with fewer hospitalizations and physician visits. It improves self-esteem and mental well-being, reduces stress and anxiety and improves sleep.

Physical activity includes any and all movements that expend energy. Many of the health benefits from being active can be achieved without having to do overly demanding or vigorous exercise. We should try to include in our daily lives the everyday activities which keep us moving around: walking, climbing stairs, physical labour, carrying things, household jobs. Great improvements in physical fitness can be made by changing from a sedentary to a moderately active lifestyle. The best way to keep active is to include as much movement as possible into our daily routine.

Different types and intensities of physical activity will improve different elements of health and fitness. All exercise should be built up gradually and carried out regularly, avoiding irregular, overly strenuous activities. People who do physically demanding work or practise strenuous sports regularly need to make sure they get enough food to meet their energy needs and rest and relax to allow their bodies to recover. The accumulation of small but regular periods of movement during work, school or leisure can make a significant difference in energy balance and weight control over time. For example, a daily 20-minute brisk walk can make a difference of up to 5 kgs per year, and for most people there will be improvements in cardiovascular fitness and potential for other physical and mental health benefits. To provide maximum benefits for all areas of the body, a range of specific strengthening and stretching exercises are also needed. This is particularly important for older people.

- Aerobic activities: such as brisk walking, jogging and swimming. These speed heart rate and breathing and improve heart and lung fitness.

#### TO THINK ABOUT WHILE READING



How important is  
physical activity?

Why do people  
need to do  
different kinds of  
physical activity?








Are you active  
enough every day?



- Resistance, strength and weight-bearing activities: such as carrying a child, lifting weights and walking. These help build and maintain bones and muscles by working them against gravity.
- Balance and stretching activities: such as gentle stretching, dancing, yoga, martial arts. These enhance physical stability and flexibility, which reduces risk of injuries.





### MATERIALS

-  Ask yourself work sheet *Health benefits of physical activity*
-  Answer work sheet *Health benefits of physical activity*
-  Ask yourself work sheet *Understanding activity levels*
-  Ask yourself work sheet *Aerobic, strengthening and stretching activities*
-  Example work sheet *Aerobic, strengthening and stretching activities*
-  Ask yourself work sheet *My physical activity*
-  Fact sheet *Intensity levels of physical activity*




### ACTIVITIES

#### Health benefits of physical activity

-  Discuss or think about what being fit and physically active means to you. What are the health benefits of physical activity? Use the Ask yourself work sheet *Health benefits of physical activity* to list as many benefits as you can think of. Compare your ideas to the Answer work sheet *Health benefits of physical activity*.
- 

#### Light, moderate and vigorous activities

Discuss how various activities use (burn) different levels of calories. Some activities burn few calories, some activities burn a moderate level of calories and some activities burn a great deal of calories. We can call these light, moderate and vigorous activities.

-  Use the Ask yourself work sheet *Understanding activity levels* or copy it on a board or in a notebook. Suggest types of activities that are good examples of each of the three activity levels and write them in the appropriate columns.



## Aerobic, strengthening and stretching activities



Go to the Ask yourself work sheet *Aerobic, strengthening and stretching activities* and fill in as many examples as you can think of for each type of activity. Compare your examples to the Example work sheet *Aerobic, strengthening and stretching activities*.



## Are you active enough?



As an individual activity, keep track of all the activities you do each day for one week and record them on the Ask yourself work sheet *My physical activity*. Review and evaluate your activities by answering the questions on the work sheet and make a plan to improve your physical activity.



### KEY POINTS

**Review these three key points** to remember about keeping fit and active for good health. Reflect on your own physical activity and try to include more movement in your daily life.

## Keeping physically active and fit

- Regular physical activity is good for our health and well-being. It can decrease the risk of serious diseases, such as heart disease, diabetes, joint and bone problems, insomnia.
- Being physically active means including movements that expend energy into our daily routine. These small changes over time will improve our health and weight.
- A combination of different types of physical activities – aerobic, strengthening and stretching – provides maximum benefit to all parts of our body.





# Health benefits of physical activity

**Do you know how physical activity can improve your health?  
List all the health benefits you know of.**

Physical activity includes any and all movements that expend energy.

Some ways in which physical activity can improve our health:

- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....



★ You can compare your ideas with Answer work sheet *Health benefits of physical activity*



# Health benefits of physical activity

*Physical activity improves health in many ways and when carried out regularly can help lower the risk of some serious diseases.*

Physical activity can:

- help in **weight** loss and weight control
- help to reduce body **fat**
- rebuild or preserve **muscle mass**
- help **lower the risk** of cardiovascular diseases and diabetes
- **improve** heart, lung and muscle functions
- **contribute** to healthy bones
- improve the **strength and movement** of joints
- increase **flexibility** and improve the range of body movement
- improve self-esteem and **mental well-being**
- **reduce** stress and anxiety.



Use this answer sheet to check your answers on the Ask yourself work sheet **Health benefits of physical activity**



# Understanding activity levels

**Suggest types of activities that are good examples for each of the three activity levels and write them in the appropriate column.**

Every movement and activity has a *different level* of intensity.

Some activities require more energy than others. The best way to keep active is to include as much movement and as many different kinds of movement as possible in our daily routine.

<b>Light activities</b>	<b>Moderate activities</b>	<b>Vigorous activities</b>
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

**★ You can find more information on activity levels on *Intensity levels of physical activity* Fact sheet**

**★ Here are some examples for you:**

<b>Light activities</b>	<b>Moderate activities</b>	<b>Vigorous activities</b>
reading	dancing	running
sitting	walking fast	swimming
office work	riding a bike	rowing
cooking	heavy housework	cycling
light gardening	digging	football



# Aerobic, strengthening and stretching activities

**How much do you know about aerobic, strengthening and stretching activities? Add as many examples as you can think of for each type of activity.**

*Different types and intensities of physical activities will improve different aspects of health and fitness.*

**Aerobic activities** are activities of relative low intensity and long duration. As the body requires more oxygen, heart rate increases and lung capacity improves.

- swimming
- .....
- .....
- .....
- .....
- .....

**Resistance, strength and weight-bearing activities** are essential for building and maintaining healthy bones. During weight-bearing exercises, bones adapt to the impact of weight by building more bone cells. Consequently bone becomes stronger and more dense.

- carrying a child
- .....
- .....
- .....
- .....
- .....

**Balance and stretching activities** help improve physical stability, flexibility and help reduce injuries to muscle and bone.

- dancing
- .....
- .....
- .....
- .....
- .....



**You can compare your ideas with Example work sheet Aerobic, strengthening and stretching activities.**

# Aerobic, strengthening and stretching activities

**Some activities provide specific benefits for specific areas of the body.**

**Other activities are more complete, providing multiple benefits.**

Swimming is an example of an activity that is more complete; it increases lung capacity and endurance, uses all major muscle groups and improves overall body flexibility. Moderate to fast walking and cycling strengthen the cardiovascular system, use leg and thigh muscles and improve bone density. Carrying or lifting weights improve overall body strength and use arms and upper body muscles.

There are many activities that can be done on our own, in groups or in organized team sports, and many simple everyday activities that will improve different aspects of fitness. We need to include a variety of different types of activities in our daily lives in order to get the maximum benefits to all areas of the body and to overall health.

## Here are just a few examples for each type of activity:

**Aerobic activities** are activities of relatively low intensity and long duration. As the body requires more oxygen, heart rate increases and lung capacity improves.

- swimming
- fast walking
- jogging
- rowing
- ice-skating
- cycling

**Resistance strength and weight-bearing activities** are essential for building and maintaining healthy bones. During weight-bearing exercises, bones adapt to the impact of weight by building more bone cells. Consequently, bones become stronger and increase in density.

- carrying a child
- climbing stairs
- lifting weights
- tennis
- skiing
- step-up aerobics

**Balance and stretching activities** help improve physical stability and flexibility, thus helping reduce injuries to muscle and bone.

- dancing
- yoga
- quadriceps (leg) stretch
- biceps (arm) stretch
- hamstring (leg) stretch
- pectoral (chest) muscle stretch



★ **This example work sheet will help you to complete**  
Ask yourself work sheet **Aerobic, strengthening and stretching activities**

# My physical activity

**How active are you?**  
**Keep track** of your activities for one week and **record** them on this table.  
**Review** your activities and make a plan.  
 See how you can **improve** your physical activity every day.

Day of the week	Activities	Length of time
Monday	• ..... • ..... • .....	• ..... • ..... • .....
Tuesday	• ..... • ..... • .....	• ..... • ..... • .....
Wednesday	• ..... • ..... • .....	• ..... • ..... • .....
Thursday	• ..... • ..... • .....	• ..... • ..... • .....
Friday	• ..... • ..... • .....	• ..... • ..... • .....
Saturday	• ..... • ..... • .....	• ..... • ..... • .....
Sunday	• ..... • ..... • .....	• ..... • ..... • .....

1. Do you think you are active enough? Too much? Too little? The right amount?
2. How much time every day were you active?
3. How much time did you spend sitting?
4. Do you think that you had the right amount of moderate and vigorous activities?
5. In what ways can you include more movement into your daily routine?
6. Make an activity plan for yourself, based on your current level of activity, your health, body weight and any special medical conditions. Be realistic and try to follow it.



# Intensity levels of physical activity



- |          |   |
|----------|---|
| <b>1</b> | <ul style="list-style-type: none"> <li>• sleeping</li> <li>• lying down</li> </ul>  |
| <b>2</b> | <ul style="list-style-type: none"> <li>• sitting</li> <li>• reading</li> <li>• writing</li> <li>• note-taking</li> <li>• studying</li> <li>• watching t.v.</li> <li>• knitting</li> <li>• playing cards</li> </ul>            |
| <b>3</b> | <ul style="list-style-type: none"> <li>• dressing</li> <li>• grooming</li> <li>• dusting</li> <li>• washing dishes</li> <li>• driving</li> <li>• cooking</li> <li>• ironing</li> <li>• light gardening</li> </ul>             |
| <b>4</b> | <ul style="list-style-type: none"> <li>• walking</li> <li>• playing with a child</li> <li>• gardening</li> <li>• washing windows</li> <li>• walking steady</li> <li>• making beds</li> <li>• playing an instrument</li> </ul> |
| <b>5</b> | <ul style="list-style-type: none"> <li>• dancing</li> <li>• walking fast</li> <li>• walking uphill</li> <li>• skating</li> <li>• horse riding</li> <li>• gymnastics</li> <li>• diving</li> <li>• basketball</li> </ul>        |
| <b>6</b> | <ul style="list-style-type: none"> <li>• running</li> <li>• swimming</li> <li>• tennis</li> <li>• football</li> <li>• cycling fast</li> <li>• pushing furniture</li> <li>• digging</li> <li>• rowing</li> </ul>               |



★  
 You can use these examples  
 of activity intensity levels  
 to help you complete  
 Work sheet **My physical activity**







## LEARNING OBJECTIVES



*By the end of  
the lesson, you  
will be able to:*

- explain how good personal hygiene, clean water and clean living conditions contribute to good health and prevention of disease;
- evaluate your personal hygiene habits and living conditions and take steps to improve them;
- describe the water quality and sanitary conditions in your community and make suggestions for improvement.

## Lesson 11

# Keeping ourselves, our water and our surroundings clean

## LESSON OVERVIEW



This lesson is about how good personal hygiene, safe water and clean living conditions contribute to good health and prevention of disease. It describes good habits and practices to follow to keep ourselves and our surroundings clean and free from harmful germs. It begins with a discussion of how to prevent the spread of germs and infectious diseases through good hand washing, bathing and other personal hygiene practices. It then discusses the importance of clean water for life and good health. It describes how to protect water from contamination and explains some simple ways to make water safe to drink. Finally, it discusses how unsanitary conditions in the home and in the community affect our health and provides some examples of good practices to follow to keep the spaces we live in clean.



**Part 1**

# Personal hygiene: keeping our bodies clean



## READING

GermS are very tiny creatures (organisms) that live all around us. They are too small to be seen by the human eye. GermS live in the soil, on all surfaces, on our skin, in our bodies, and in the intestinal tracks of people and animals. GermS are alive and grow and multiply with food, water, time and warmth.

GermS are spread easily in many different ways. They are spread through the air, through hands and through body fluids such as saliva and blood. GermS can get inside any opening of the body- eyes, ears, nose, mouth, genitals, cuts and wounds- and they are easily transferred from one area of the body to another. GermS are also spread through water, food and insects.

Most germS are not harmful. Many germS are beneficial to us; in our bodies, some germS help us digest food and help keep us healthy. Some “good” germS also help make certain foods, such as cheese and yoghurt. Some germS are used to make vaccines against certain diseases and medicines, such as the antibiotic penicillin, which saves many lives by killing harmful bacteria.

However, some germS can be very harmful if they get into our foods, our water and enter our bodies and are allowed to grow. Any opening into the body (eyes, ears, nose, mouth) provides an opportunity for germS to enter and cause disease. The common cold and flu, diarrhoea, and serious diseases such as cholera and tuberculosis are caused by harmful germS. These diseases spread by germS are called “infectious” diseases because they enter the body, “infect” us and then are spread to other people who also become “infected”. These germS are spread easily from person to person. For example, cholera, an infection caused by bacteria in the small intestine, occurs mainly by drinking water or eating food that has been contaminated by faeces from an infected person. Tuberculosis, an infectious disease primarily attacking the lungs, is spread through the air from person to person when a contaminated person coughs or sneezes. Both cholera and tuberculosis affect millions of people worldwide, often resulting in death.

Our bodies have a natural defence system against many harmful germS. The skin acts as a strong barrier against the entry of germS into the body. The stomach has a harsh, acidic environment that is too strong for most germS to survive and grow. When the body’s immune system is strong and functioning well, germS that get into the body can usually be destroyed.

### TO THINK ABOUT WHILE READING



How do we get  
germS that  
cause disease?

How can keeping  
our bodies clean  
improve  
our health?

How do  
your personal  
hygiene habits  
affect  
your health?



All people are exposed to germs and therefore are at risk of infections caused by germs. Some people, however, are particularly vulnerable to infections from harmful germs and need to be especially careful to prevent minor infections from becoming serious.

People who need to be especially careful are:

*Children, especially newborn babies.* A fragile immune system at birth and a lack of vaccination against certain diseases make newborn babies very vulnerable to infections caused by germs. Care should be taken to protect them from being exposed to harmful germs. Breastfeeding will increase a baby's resistance to certain diseases, as the mother passes on her own immune factors through her milk to the baby.

*Pregnant women.* During pregnancy, it is important to avoid infections and illnesses that can be harmful to the health and development of the unborn baby.

*People with a weak immune system or poor nutritional status.* When people are ill, malnourished or in poor health, their immune systems are weakened and may not be strong enough to defend against disease. This makes them more susceptible to the attacks of harmful germs. It is important to help them avoid infection.



**For more information,** see Fact sheet [The truth about germs.](#)

Personal hygiene – the practice of caring for the body through cleaning and grooming – helps prevent the spread of harmful germs and diseases. Keeping the body clean also helps prevent body odour and the accumulation of dirt. Good personal hygiene habits should always be practised to help keep ourselves and the people around us healthy.

One of the most effective ways to help prevent the spread of germs is good and frequent hand washing. Hands are a primary source of germs. They carry millions of germs that we cannot see and can easily pass to everything and everyone we touch. We can help protect ourselves and others from diarrhoea, cholera, intestinal worms, flu, eye infections and many other infections caused by harmful germs through good hand washing. Hands should be washed often, and always after using the toilet, before eating and preparing food, after changing babies, tending to people who are ill, handling rubbish and touching animals. Wetting hands with water is not enough to remove all the dirt and germs from the hands. Hands should be washed with soap and clean water, rubbing thoroughly outside the stream of water for at least 20 seconds, then rinsed under clean running water and dried with a clean towel.



**For more information,** see Fact sheet [12 steps to good hand washing.](#)



A dirty body encourages the growth of germs. Dust, sweat, body fluids and warmth all encourage germs to grow and multiply. Regular bathing with clean water and soap removes dirt, dead skin and sweat. It helps prevent skin irritations and infections by removing germs and cleaning wounds. It also prevents unwanted body odour and creates a feeling of well-being, cleanliness and comfort. Girls and women should maintain a high level of hygiene during menstruation to avoid infections.

Many germs live and multiply in the mouth. Good oral hygiene, especially frequent teeth brushing and cleaning, limits the spread of bacteria that can cause tooth decay, tooth loss, gum disease, ulcers and other mouth infections. The nose is also a good place for germs to hide and multiply. Good practices for nose blowing, coughing and sneezing will help limit the spread of germs.



**For more information,** see Fact sheet *Keeping yourself clean and free from germs.*

Dirty (contaminated) water and spoilt food also spread harmful germs and bacteria. It is important to protect our health by using safe, clean water for drinking, cooking and washing and by keeping our food safe and free from insects, pests and harmful bacteria.



**For more information,** see Part 2 *Clean and safe water.*

Good nutrition can improve the body's resistance to diseases caused by harmful germs. It keeps the body's natural defence system strong and functioning well. A strong immune system can usually destroy harmful germs that get into the body.



### **MATERIALS**



Fact sheet *The truth about germs*



Quiz work sheet *Germs: true or false?*



Fact sheet *12 steps to good hand washing*



Match it work sheet *Proper hand washing*



Ask yourself work sheet *My personal hygiene*



Fact sheet *Keeping yourself clean and free from germs*



## ACTIVITIES

### Germ: true or false?



Take this quick *quiz* to check your understanding of some basic facts about germs. Look for hints on the Fact sheet *The truth about germs*.

### Spreading the germs

The aim of this activity is to demonstrate how hands easily spread germs from person to person.

*If working in a group*, invite two or three volunteers and put a few drops of oil or lotion on the palms of their hands. Ask them to rub their palms together to spread the oil.

Then spread a small amount of glitter on their palms. (In place of glitter: sand, earth, salt, sugar, finger paint or food colouring can be used).

Ask the volunteers to shake hands with several others in the group, who should then shake hands with others.

Stop the game when everybody's hands have been touched. Tell the group that the glitter represent germs and discuss the following:

What happened when you shook hands?

Did any player accidentally touch his face, mouth, nose? Can you see glitter in those areas?

What happens when you touch people or objects with dirty hands?

What should you do to stop passing the germs on?



Review the *12 steps to good hand washing* Fact sheet and if possible, have all players wash their hands following the 12 steps.



*If working individually*, follow the same steps above with your friends or family. You can also touch commonly used objects around the house to see how the glitter passes from hands to objects and then to other hands as other people in the house touch the objects. Review the *12 steps to good hand washing* Fact sheet and wash your hands following the 12 steps.

### Proper hand washing



Are you sure you wash your hands properly? Go to the Work sheet *Proper hand washing* to see if you can match the hand washing practices with their correct endings. Do you follow these practices?

### My personal hygiene



Do you think you have good personal hygiene habits? Use the Ask yourself work sheet *My personal hygiene* to record everything you do to keep yourself clean and free from germs. Then make a plan to improve your personal hygiene habits.



### KEY POINTS

**Review these three key points** to remember about the importance of keeping clean.

See how you can apply this knowledge to improve your own washing and grooming habits and to protect you and your family from germs.

- Germs are invisible living organisms that can be found everywhere, including our own body. While many germs are not harmful, some germs can be very harmful if they get into our foods, our water or our bodies.
- Everyone needs to be protected from harmful germs. Babies, pregnant women and people with a weak immune system are even more vulnerable to infections caused by harmful germs. Special efforts should be made to protect them and to avoid passing germs to them.
- Keeping our bodies clean and protecting ourselves from harmful germs is an important part of keeping well and healthy. Frequent and proper hand washing, bathing, teeth cleaning and other personal hygiene practices can help protect us from some diseases caused by germs and can help prevent spreading germs to others.



## Part 2

# Clean and safe water



## READING

**Water is essential for life.** People, animals and plants all need water to live and to grow. Water is so important to human life that we can survive only a few days without it. Water makes up a large part of the human body. It is a vital component of all body fluids, tissues and cells. Water composes about 70 percent of the brain, 83 percent of blood and 90 percent of the lungs. Water is essential to many functions in the body. It helps carry oxygen and nutrients to cells, regulates body temperature, allows better blood circulation, protects vital organs, keeps tissues and joints moist and removes waste. When the tissues and cells are well supplied with water, they can fight infections more efficiently.

A person needs 2–4 litres of water every day to replace the fluids lost through breathing, sweating, urination and other body processes. These can be replenished by drinking water and other liquids and eating foods with high water content. When a person does not get enough water or loses too much water, for example due to fever or diarrhoea, the body becomes dehydrated (dried out). Severe dehydration can result in death.

**Without clean water for drinking and for proper hygiene, it is difficult to reduce the spread and impact of many serious and life-threatening diseases.** Many communities rely on water from rivers, streams, lakes and ponds as their only source of drinking water. Often the water that is available is not safe to drink. An estimated 1 billion people in the world do not have access to enough fresh, clean water to meet their basic needs and 2.6 billion do not have enough water for proper sanitation. Every day, nearly 4,000 children die from diseases associated with unsafe drinking water and poor sanitation.

Contaminated (not clean) drinking water can lead to many serious diseases such as diarrhoea, cholera, typhoid, dysentery, worm infections, malaria, hepatitis and trachoma (an eye infection that can lead to blindness). Drinking water polluted with chemicals and pesticides can also lead to a number of serious diseases, including some cancers. A reliable supply of safe water can mean the difference between life and death. In hospitals, clinics and other places where sick people get care, lack of water for proper hygiene can allow infection to spread from person to person. Health problems resulting from a scarce supply of water or from unclean water

### TO THINK ABOUT WHILE READING



How important  
is water for life?

How many people  
in the world  
do not have clean  
drinking water?

What can happen  
when a person  
drinks water  
that is not clean?



can be especially dangerous to people who are already affected by chronic or life-threatening illnesses, such as HIV/AIDS.



**See** Fact sheet *Health problems from unsafe water* for more information on illnesses caused by unclean water.

**Problems of access to water affect many people in many parts of the world.** An estimated 40 percent of the world's population is affected by water shortages. Half of all poor people live in the driest areas of the world. By the year 2025, 1.8 billion people will be living in countries or regions with serious water shortages and about two-thirds of the world's population could be living under water-stressed conditions. Fresh water is a limited resource and its availability is being affected by many factors, including the need for water to provide food for a growing population, climate change, environmental pollution and poor use and management of water resources. Fair and affordable prices for water services and equitable distribution of water for irrigation, industry and family use are very important for ensuring adequate access to water.

Lack of adequate water holds back the economic and agricultural development of a community, limiting people's ability to produce their own food or earn enough income for an adequate standard of living. For farmers and their families, an inadequate water supply means hunger when drought causes crops to fail. Lack of water limits the ability to operate industries and provide sufficient energy.

**Water is vital for producing food.** Lack of adequate water limits our ability to produce enough food to feed the world's population. Agriculture is the number-one user of water worldwide, accounting for about 70 percent of all fresh water drawn from lakes, rivers and underground water supplies (aquifers). On average, it takes about 5 000 litres of water to produce food for one person every day. Water is needed to irrigate crops in areas where rainfall is not sufficient. Plants need large amounts of water to grow and develop properly. For example, about 1 000 litres of water are needed to produce one kilogram of wheat.

Water is also needed to water livestock and to grow animal feed. Animals raised on irrigated grain require more water than those raised on rainfed grazing land. Water is needed for fish farming, or aquaculture. Fish can be farmed both in saltwater and in freshwater lakes, rivers, ponds and tanks. Nearly half of all fish eaten in the world today is produced on fish farms. Water plays a central role in food processing and preparation. It is used for cooking, boiling, steaming, washing, cooling and preserving food.

**Water sources must be protected to keep them clean and safe to use.** Water sources must be protected from many serious threats to cleanliness and safety, such as human and animal wastes, poorly built sanitation systems, leaking sewer pipes, rubbish dumps, industrial pollution, pesticides and fertilizers. People, communities, government and private agencies must work together to





ensure an adequate supply of safe water. Community members should be actively involved in selecting the type of water supply and have access to information that allows them to make informed decisions. When a community has a water supply that is accessible and safe, everyone's health is improved.

If there is any chance that water has been contaminated, it must be treated to make it safe to drink. Surface water from ponds, streams, lakes and rivers must always be treated before drinking. Boiling water or treating water with chlorine (disinfecting) are two common and effective ways to make water safe to use. Boiling water for a few minutes destroys most types of germs that can cause disease. If it is not possible to boil water, disinfecting water with chlorine will kill most bacteria and some viruses that may cause disease.



**See** Fact sheet *Easy ways to make water safe to drink* for more details on how to disinfect water.







**Some actions that can be taken to prevent the contamination of ponds, streams, lakes and rivers are:** keeping people and animals from urinating and defecating in or near water; keeping animals out of water sources; disposing of rubbish and trash properly and not in or near the water; treating and disposing properly wastewater and toxic products; fixing or replacing broken or leaking pipes and tanks as soon as they are broken; and building steps or ramps at the water's edge to encourage people not to walk into the pond or lake when collecting water.

**Some actions that can be taken to prevent contamination of groundwater sources such as wells, springs and boreholes are:** keeping water sources covered at all times; using only clean buckets or scoops to draw water and fill other containers; washing hands properly before collecting water; avoiding stepping into the water or touching it with hands while collecting it; building a fence to keep animals out; making sure that no surface water can run directly into water sources by lining them with bricks or concrete rings; digging a drainage canal to allow spilled water to flow away without causing puddles; and keeping latrines, rubbish dumps and other sources of contamination far away.

**Some actions to store water safely and keep it clean in the home are:** never store water in containers that have been used for pesticides or chemicals, even if they have been cleaned; use only clean containers and water bottles to store water and clean the containers regularly; cover water containers to keep dust, insects, animals and other contaminants from getting into the water; keep water containers off the floor and away from animals; pour water without touching the mouth of the container, or use a clean, long-handled scoop to take out water; dry all water spills to avoid breeding grounds for mosquitoes that are carriers of malaria, dengue fever and other diseases.



## MATERIALS

-  Fact sheet *Basic facts about water*
-  Match it work sheet *Water facts matching*
-  Fact sheet *Easy ways to make water safe to drink*
-  Fact sheet *Health problems from unsafe water*
-  Ask yourself work sheet *How clean is my water?*
-  Into the field work sheet *How good is your community water supply?*



## ACTIVITIES

### Water facts matching



How much do you know about water? Go to the Match it work sheet *Water facts matching* to test your knowledge of some basic water facts. Can you match each fact with its correct ending?

### Learn how to filter water

Take a clear bottle or glass and fill it with muddy, cloudy water. You can make muddy water by adding mud, earth or sand to clear water. Let it stand for some time so that the solid material sinks to the bottom. In the meantime, make a cloth filter by folding a clean cloth several times and tying it over the mouth of another clear, clean bottle, glass or container for water. Take the water you let stand and pour it slowly through the filter and into the clean bottle without disturbing the sediment (solid material) at the bottom. Remove the filter carefully and observe the water. It should be clearer than it was before filtering. Settling and filtering water in this manner helps reduce the number of germs and makes water safer, but not completely free from germs. Many germs invisible to the eye will remain in the water.



See Fact sheet *Easy ways to make water safe to drink* for more details.

### Learn how to disinfect water

Take 1 litre of filtered water and add 2 drops of household chlorine bleach. Mix it with a clean spoon or shake the container gently to mix. Cover the water and bleach mixture and let stand for 30 minutes. Smell the water. It should have a



slight chlorine smell. If it does not, add another drop or two of chlorine and allow it to stand for an additional 15 minutes. If the treated water has too strong a chlorine smell, pour it back and forth several times from one clean container into another. The chlorine will have killed most of the bacteria and some viruses that may cause disease and the treated water should now be safe to use.



See Fact sheet *Easy ways to make water safe to drink* for more details.

## How clean is your water?



Use the Ask yourself work sheet *How clean is my water?* to conduct a survey of your water supply at home. Is your water safe? Do you collect and store it properly? What can be improved? Make a plan to improve the quality of your water and protect your family from diseases that are caused by contaminated water.

## How good is your community water supply?



Use the Into the field work sheet *How good is your community water supply?* to evaluate the water supply in your community and make suggestions for improvements. Interview your family, neighbours, health workers, teachers and authorities about the quality of the local water supply. Is it safe? Is it enough for everyone? Does it affect people's health? Are there any cases of diseases caused by contaminated water? Share the results of your investigation and suggest actions that should be taken to improve your community water supply.



### KEY POINTS

**Review these three key points** to remember about the importance of water for life and health. See how you can apply this knowledge to keep your water clean and safe for drinking, cooking and bathing.

- Water is essential for life and good health. People, animals and plants cannot live and grow without water. A person needs 2–4 litres of clean drinking water a day to replace fluids lost through different body processes.
- Contaminated water can cause many illnesses. Diarrhoea, cholera, typhoid, dysentery, worm infections and other diseases are easily spread to people by unclean water.
- All sources of water need to be protected from contamination. Water that is not clean and safe must be treated before using it for drinking, cooking or bathing. Boiling or chlorinating water are two effective ways to disinfect water in the home.



### Part 3

## Clean living conditions



### READING

Where we live and the conditions in which we live affect our health. Poor living conditions in the home and in the community encourage the growth and spread of many germs that cause disease. Keeping the places we live in and the spaces around us clean and free from harmful germs and contaminants is just as important for good health as keeping our body and our water clean.

About 2.4 billion people around the world live in unhealthy, unsanitary conditions. They do not have good housing or access to clean water, adequate sanitation facilities and proper rubbish collection and disposal. In addition, many everyday habits and practices are unsafe and contribute to an unhealthy environment. The lack of basic facilities and services, especially when combined with poor hygiene habits, greatly increases the spread of many serious infectious diseases. In many countries, diseases related to poor sanitation are among the major causes of death.

One of the most serious threats to people's health is poor disposal of human waste. Human waste carries very harmful bacterial and viral diseases and parasites. If waste is deposited in the open, close to populated areas or near people's homes, it can spread disease easily. Open defecation is a very dangerous practice. When people defecate in the open, flies and other pests feed on the faeces, carry germs on their feet and pass them on to people, surfaces and food. Faeces left in the open can be washed by rain into wells, streams and other sources of water that people use for drinking and for bathing. When adequate toilet facilities or latrines are not available for the safe disposal of human waste, people need to bury their waste safely, so that it does not contaminate people, animals and water sources. Indoor and outdoor toilet facilities need to be kept clean and free from germs to avoid spreading disease.

Poor removal and disposal of household rubbish and trash is also a threat to people's health. When rubbish piles up around people's homes, insects, rodents and other pests that can spread disease are attracted. Rubbish dumped into rivers, lakes and other water sources will contaminate the water and spread disease. In addition to being a health risk, rubbish that is allowed to accumulate in and around where we live, work and play is unsightly, smelly, and degrades the quality of life. Communities should have a good system for the regular collection and proper disposal of household rubbish and trash. It is

#### TO THINK ABOUT WHILE READING



What do we mean  
by clean living  
conditions?

How can  
conditions at  
home and in the  
community affect  
our health?

What can we do  
to keep our homes  
and surroundings  
clean?



especially important to have adequate rubbish collection at public places such as schools, hospitals, markets and all places where large numbers of people meet and where food is sold, handled or eaten.

When regular collection is not provided, families need to keep their homes and the spaces they live in free from rubbish and trash by taking them to communal containers or directly to the disposal site. Communal rubbish dumps should be constructed away from houses and water sources and should be managed by people who are trained to deal with waste safely. Dumps can be a source of disease if they are not properly constructed and treated to prevent the spread of germs.

**Incorrect disposal of hazardous household waste materials can be a serious threat to humans, animals, plants and the environment.**

Many common household products, such as paints, pesticides, motor oil, ammonia, bleach, cleaning solutions and detergents, batteries, prescription medicines and electronics, contain dangerous chemicals that should not be released into the environment. These materials need to be disposed of at special sites and should never be left in the open or dumped into the air, soil or water.

Small quantities of hazardous substances can accumulate over time to reach dangerous levels and contaminate the air, water and soil. Others can have a more immediate effect, such as poisoning. Pesticides, fertilizers and other products can run off gardens into drains and streams, polluting fresh water. Solvents can escape to the atmosphere from the normal use of cleaners, paints and aerosol sprays, as well as accidental spills or improper disposal. These substances pollute the air and can also return to earth as rain, further polluting water and soil. Chemicals from hazardous wastes buried in unsecured landfills can seep out and move through the soil, eventually entering groundwater. From there, contaminants can spread to wells or surface water, making it unsafe to drink. These substances all require special handling for detoxification or safe disposal. If treated properly, most of this waste can be recycled into new products.



See Fact sheet *Basic practices for a clean and safe community* for more information.

**Good household cleaning will reduce the spread of germs and help protect the family from disease.** Regular and frequent cleaning will prevent the build-up of dirt, germs, moulds and insects that can cause illness and disease. It is important to keep all areas of the house clean, but it is especially important to keep the kitchen and eating areas and toilet and bathing facilities clean. These are the areas where germs and bacteria grow and spread most easily. Toilet and bathing facilities need to be cleaned very often to prevent the spread of germs from dirty hands and human waste. Washbasins, bathtubs and toilets should be cleaned with disinfectants. All bathroom trash should be removed and disposed of properly, including baby's diapers.

Food storage, preparation, cooking and eating areas should be cleaned after every meal. Floors should be swept and mopped, kitchen rubbish should be



removed. All surfaces and utensils should be thoroughly washed with soap and clean water or with disinfectants that kill many types of germs.

All cloths, sponges, rags, mops and other articles used for cleaning should be washed and changed as they become soiled. Use different cleaning cloths for different rooms and areas and replace them often.







★ See [Lesson 8](#) for more information on preparing and storing foods safely at home.

Keeping the air fresh in the house will help reduce moisture and humidity which encourage the growth of mould and the breeding of insects. Opening windows and doors to let in fresh air will clear the air of wood and tobacco smoke and fumes from gas-burning furnaces and cookers. Smoke from solid cooking fuels such as wood, charcoal and animal dung, can lead to respiratory and eye infections and other health problems. Dust can lead to respiratory problems and can be dangerous for people with allergies, asthma and other breathing problems. A dusty environment and poor circulation of fresh air in the house (ventilation) make the spread of tuberculosis (an infectious disease primarily attacking the lungs) easier. Changing the air frequently and keeping the house free from dust can help reduce and prevent these problems.

★ See Fact sheet [Basic practices for a clean and safe home](#) for more information.




### MATERIALS

-  Quiz work sheet *Clean living conditions: true or false?*
-  Fact sheet *Basic practices for a clean and safe home*
-  Fact sheet *Basic practices for a clean and safe community*
-  Ask yourself work sheet *Home inspection*
-  Into the field work sheet *Investigation: How clean and safe is my school?*
-  Into the field work sheet *How clean is my community?*



### ACTIVITIES

#### Clean living conditions: true or false?

-  What do we mean by good living conditions? Take this quick [quiz](#) to check your understanding of some basic facts about household and community hygiene. Look for hints in the Fact sheet [Basic practices for a clean and safe home](#) and Fact sheet [Basic practices for a clean and safe community](#).



## Home inspection



Use the Ask yourself work sheet *Home inspection* to inspect your living conditions at home. Record everything you do to keep your home clean and free from germs. Do you clean your house properly? Do you dispose of waste correctly? Are there any insects and pests that can put your health at risk? Make a plan to improve your household hygiene habits and to protect your family from germs and pests that cause disease. Discuss the plan with your family and try to follow it.

## Is my school clean and safe?



Use the Into the field work sheet *Investigation: How clean and safe is my school?* to inspect your school and make suggestions for improvements. Observe your school building, classrooms, toilets, kitchen, eating area, rubbish bins and containers, school yard. Is your school clean? Is it big enough for all the students? Are the toilets safe? Are there any cases of diseases caused by poor sanitation? Discuss these questions with your classmates and decide what can be done to improve the conditions at your school. Share the results of your investigation with your parents and teachers and suggest actions that should be taken.

## How clean is my community?



Use the Into the field work sheet *How clean is my community* to inspect your community. Are the streets clean? Is the rubbish collected regularly? Are public places – market, station, health centre – tidy and safe? Are there any health problems in your community caused by dirty surroundings and poor living conditions? Share the results of your investigation with your parents and neighbours and suggest actions that should be taken to improve your neighbourhood.



### KEY POINTS

**Review these three key points** to remember about how the conditions we live in affect our health. See how you can apply this knowledge to protect yourself and your family from serious diseases spread by germs.

- Clean living conditions, sanitary toilet facilities and proper waste disposal are essential for our health and well-being. They promote good health and help prevent disease.
- Keeping our houses clean and disposing of our waste safely is an important part of staying healthy. Washing kitchen surfaces with soap, disinfecting toilets, dusting, changing the air, and other good cleaning practices can help prevent diseases caused by germs.
- Communities should have a system for proper waste removal, deposit and treatment to protect people's health and keep the environment clean and safe.



# The truth about germs

**Did you know that many diseases are caused by germs? Here are some facts you should know to help protect yourself from harmful germs and to reduce the risk of disease.**

- 1. What are germs?** Germs are very tiny living creatures (organisms) invisible to the human eye. They grow and multiply rapidly with food, water, time and warmth. There are many types of germs; the word "germ" is used to describe all the different types of microscopic living things.
- 2. Where are germs found?** They can be found everywhere: in the air, water, soil, food, plants and on all surfaces, including our own body. They can live for hours on the skin and hands and on many surfaces and objects.
- 3. How are germs spread?** Germs are spread easily in many different ways:
- We can breathe them in from the air; for example, if a sick person coughs or sneezes nearby.
  - Germs get on our hands when we touch things.
  - Germs can spread through body fluids like saliva and blood.
  - Germs can spread through food that is improperly handled, cooked or stored.
  - They are spread through drinking or using contaminated water, if harmful germs are passed into the water supply.
  - Flies, mice, cockroaches and other pests spread germs through contact with faeces and rubbish. Malaria germs are spread by mosquitoes.
  - Germs are also transferred from one area of the body to another. They can get inside the body through any opening (eyes, ears, nose, mouth, genitals, cuts, punctures). Hands and humid areas of the body have the highest number of germs. Tattoos and body piercing are also very susceptible to infections caused by germs.

*Continued*





**4. How do germs affect our health?**

Most germs are not harmful. Some are even beneficial to our health. They live in our bodies and help us use the nutrients in the food we eat and make waste from what is left over. Some “good” germs also help make medicines and certain foods, such as cheese and yoghurt.

However, some germs can be very harmful to health. When they get inside the body they can multiply and cause infections that can put our health and life in danger. Here is a list of the top ten most dangerous infectious diseases:

1. Respiratory infections (including influenza)
2. HIV/AIDS
3. Diarrhoeal diseases (including cholera)
4. Tuberculosis
5. Malaria
6. Measles
7. Whooping cough
8. Tetanus
9. Meningitis
10. Syphilis

**5. Who is at risk of the harmful effects of germs?**

Everyone is exposed to germs and therefore is at risk of infections caused by germs. Some people are more vulnerable and need to be especially careful to avoid harmful germs:

- Pregnant women
- People with a weak immune system
- Children, especially newborn babies
- People with poor nutritional status

**6. How can we protect ourselves against germs and reduce their spread?****Keep clean**

- Wash hands regularly with soap and clean running water. This should always be done after using the toilet, before eating and preparing food, after changing babies, handling rubbish and touching anything that could have germs.
- Bathe or shower regularly. Wear clean clothes and change underwear daily.
- Brush teeth after every meal.
- Use clean paper tissues for nose blowing and to catch coughs and sneezes.
- Safely dispose used paper tissues and cloths and bandages used for cuts and wounds.

**Use safe clean water** for drinking, cooking and washing.

**Protect the quality and safety of food.** Store, handle and cook food properly. Keep it clean and free from insects, pests and harmful bacteria.

*Continued*



6. (Cont.) How can we protect ourselves against germs and reduce their spread?

**Maintain good nutritional status.** Good nutrition can improve the body's resistance to diseases caused by harmful germs. It keeps the body's natural defence system strong and functioning. A strong immune system can usually destroy harmful germs that get into the body.

7. What types of germs are there?

There are many different kinds of germs, but the four major types are: bacteria, viruses, fungi and protozoa.

**Bacteria** are tiny one-celled creatures that live off their environments. In some cases that environment is a human body. Bacteria can reproduce outside the body or within the body, causing infections. Some infections caused by bacteria include sore throats, ear infections, dental cavities, pneumonia, cholera and tuberculosis.

**Viruses** need to be inside living cells to grow and reproduce. Most viruses can't survive very long if they're not inside a plant, animal, or person. Whatever a virus lives in is called its host. Some viruses are spread by simple contact – saliva, coughing or sneezing. Some are spread through sexual contact and some are spread through contaminated blood, water or insects. Viruses cause many diseases, including chickenpox, measles, flu, viral hepatitis, herpes, polio and smallpox. HIV is a virus passed through sexual contact and by exposure to infected blood.

**Fungi** are multi-celled, plant-like organisms. Unlike other plants, fungi cannot make their own food from soil, water, and air. Instead, fungi get their nutrition from plants, people, and animals. They live in damp, warm places, and many fungi are not dangerous in healthy people. Some common fungal infections are athlete's foot (a rash between the toes), genital yeast infections and ringworm. The antibiotic medicine penicillin, which kills harmful bacteria, is made from fungi.

**Protozoa** are one-cell organisms that love moisture and often spread diseases through contaminated water. Some protozoa cause intestinal infections that lead to diarrhoea, nausea and stomach pain.

Use this fact sheet to complete the quiz  
Germs: true or false?



# Germs: true or false?

How much do you know about germs? Test your knowledge of some basic facts about germs.

	True	False
1. Germs live everywhere: in the air, water, soil, on all objects and surfaces, on our skin and in our body.	<input type="checkbox"/>	<input type="checkbox"/>
2. Germs are too small to be seen.	<input type="checkbox"/>	<input type="checkbox"/>
3. All germs are harmful.	<input type="checkbox"/>	<input type="checkbox"/>
4. Germs can enter the body through any opening: eyes, ears, nose, mouth, genitals, cuts and open wounds.	<input type="checkbox"/>	<input type="checkbox"/>
5. When harmful germs get inside the body they can spread and cause infections.	<input type="checkbox"/>	<input type="checkbox"/>
6. A strong immune system can help protect us from many harmful germs.	<input type="checkbox"/>	<input type="checkbox"/>
7. There isn't anything we can do to protect ourselves from germs.	<input type="checkbox"/>	<input type="checkbox"/>
8. Keeping ourselves clean can limit the spread of germs and reduce the risk of disease.	<input type="checkbox"/>	<input type="checkbox"/>
9. Personal hygiene is our personal business. Others will not be affected if we do not practise good hygiene.	<input type="checkbox"/>	<input type="checkbox"/>
10. Germs are released into the air when we cough and sneeze and can be passed on to others.	<input type="checkbox"/>	<input type="checkbox"/>
11. Keeping hands clean is a good way to keep germs from entering the body or spreading to others.	<input type="checkbox"/>	<input type="checkbox"/>
12. Germs can hide and multiply in clothing so we need to wash and change our clothes often.	<input type="checkbox"/>	<input type="checkbox"/>
13. Good nutrition doesn't have any effect on how the body defends itself against germs.	<input type="checkbox"/>	<input type="checkbox"/>



For more information on germs see Fact sheet **The truth about germs.**

Answer key: 1 True; 2 True; 3 False; 4 True; 5 True; 6 True; 7 False; 8 True; 9 False; 10 True; 11 True; 12 True; 13 False.

# 12 steps to good hand washing

Are you washing your hands properly? Follow and practise these 12 simple steps to good hand washing.

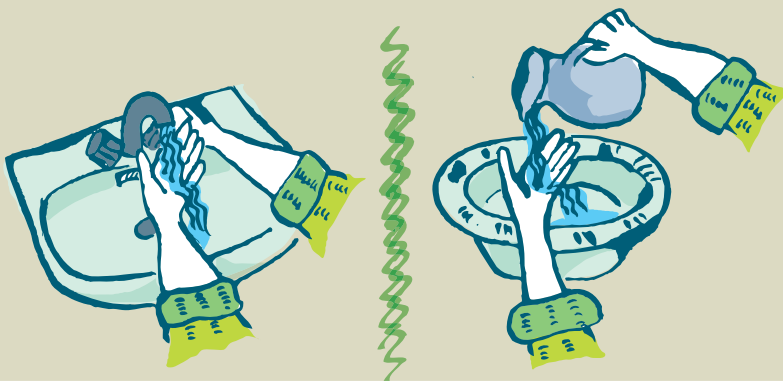
1

Roll up your sleeves.



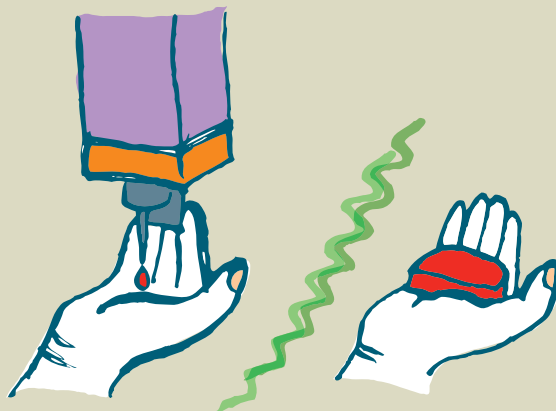
2

Wet your hands and wrists with clean water.



3

Put some soap on your hands. If soap is not available, you can use ash.



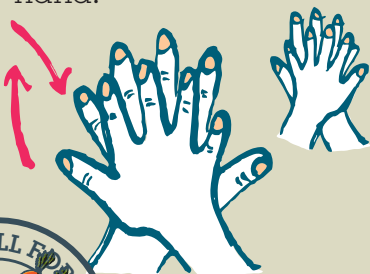
4

Rub hands together palm-to-palm. Work up a good lather.



5

Rub with right palm over the left hand, then left palm over the right hand.



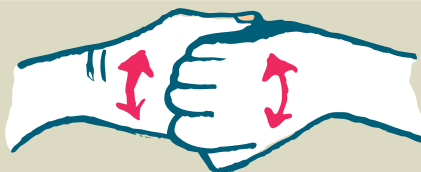
6

Wash between your fingers and under your nails. If there is a lot of dirt under nails, a little brush may be used to remove it.



7

Make a loose fist and rub the backs of the fingers.



★ Use this Fact sheet to help you complete the **Proper hand washing** Match it work sheet and to practise good hand washing.

**8**  
Grasp the left thumb with the right hand and rub some more. Then use the left hand to clean the right thumb.

**9**  
Clean the tips of your fingers by rubbing them against the palm of the other hand.

**10**  
Rinse hands thoroughly under a stream of clean water.

**11**  
Dry hands with a clean paper or cloth towel.

**12** Ideally, you should use a paper towel to turn the tap off and open the door if necessary.

Safe!

# Proper hand washing

1. Wash your hands for about...
2. Wet your hands and wrists...
3. Put some soap on your hands...
4. Rub your right palm over the left hand, ...
5. Wash between...
6. Make a loose fist...
7. Grasp the left thumb...
8. Then use the left hand...
9. Clean the tips of your fingers by rubbing them...
10. Rinse hands thoroughly under...
11. Dry hands...

Are you sure you wash your hands properly?  
See if you can match each hand-washing practice  
with its correct ending.  
Do you follow these practices?

- A. ...a stream of clean water.
- B. ...with a clean towel.
- C. ...to clean the right thumb.
- D. ...and rub hands together palm-to-palm.
- E. ...then left palm over the right hand.
- F. ...and rub the backs of the fingers.
- G. ...with the right hand and rub some more.
- H. ...15–20 seconds.
- I. ...with clean water.
- J. ...against the palm of the other hand.
- K. ...your fingers and under your nails.



★ See the best way  
to wash your hands on Fact sheet  
12 steps to good hand washing.

Answer key: 1H, 2I, 3D, 4E, 5K, 6F, 7G, 8C, 9J, 10A, 11B



# My personal hygiene

**Do you think you have good personal hygiene habits?**  
**Record** with an **X** or a **✓** on the work sheet everything you do to keep yourself clean over a week. **Review** your habits and **make a plan** to improve them. See how you can **improve** your personal hygiene every day.

Washing and grooming activities	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Wash face							
Wash hands							
Brush teeth							
Wash hair							
Comb hair							
Wash feet							
Shower or bath							
Change underclothes							
Change bedding							
Change towels							

1. Do you think you have good personal hygiene habits? Yes  No
2. Do you practise each of these habits often enough? Yes  No
3. Do you wash and groom yourself properly? Yes  No
4. In what ways can you improve your hygiene?
5. Make a plan to improve your personal hygiene and try to follow it.



**For information** on personal hygiene check Fact sheet **Keeping yourself clean and free from germs.**

# Keeping yourself clean and free from germs

## ...IT'S IN YOUR HANDS!

Keeping our bodies clean helps us **stay healthy** and free from harmful germs. Good personal hygiene can help **prevent** flu, diarrhoea, cholera and many other infectious diseases. Frequent and proper hand washing and bathing should **become everybody's daily habit**.

## 1. Hands

Our hands are a primary source of germs. They carry millions of germs that we cannot see and can easily pass to everything and everyone we touch. One of the most effective ways to prevent the spread of germs is good hand washing. We can help prevent diarrhoea, cholera, intestinal worms, flu, eye infections and many other infections caused by harmful germs through good hand washing.

Wetting hands with water is not enough to remove dirt and germs from the hands. Hands should be washed with soap and clean water, rubbing thoroughly outside the stream of water for at least 20 seconds, and then rinsed under running water and dried with a clean cloth or paper towel.

### Always wash hands:

- ✓ after using the toilet
- ✓ before eating
- ✓ before and after handling food
- ✓ after sneezing, coughing, blowing your nose
- ✓ before and after touching cuts, wounds and body fluids
- ✓ when you or somebody else close to you is ill
- ✓ before touching or feeding a baby
- ✓ after changing a baby's diaper
- ✓ after touching a public surface
- ✓ after touching or removing rubbish
- ✓ after cleaning the house

★ See Fact sheet **12 steps to good hand washing** for more details on how to make sure our hands are clean and free from germs.





- ✓ after gardening or touching soil
- ✓ after touching animals
- ✓ every time you feel you have touched something that could be contaminated with germs.

## 2. Body

A dirty body encourages the growth of germs. Dust, sweat, body fluids and warmth all encourage germs to grow and multiply. Regular bathing with clean water and soap removes dirt, dead skin and sweat. It prevents skin irritations and infections by removing germs and cleaning wounds. It also prevents unwanted body odour and creates a feeling of well-being, cleanliness and comfort.

- ✓ **Take a shower or bath daily.** Use clean water and soap. When washing, start from the top: wash your head, face, shoulders, abdominal area, legs, sexual organs and feet. Take special care to wash behind the ears, back of the neck, the armpits, the groin and other hair-covered places where germs find sweat and dead cells to feed on.
- ✓ **Keep your hair clean and neat.** Shampoo regularly (several times a week) to prevent the buildup of dirt and oil. Brush and comb your hair every day to avoid tangles. Check for lice and other insects. If lice are found, take steps to get rid of them as soon as possible by using a special shampoo and removing eggs from the hair with a special comb. Wash all towels, bed linen and recently worn clothing in hot water.
- ✓ **Wash your face** with soap and water in the morning and at night before going to bed.
- ✓ **Keep your ears clean** by preventing dust and dirt from entering. Clean your outer ears with warm water and soap. Be careful to keep water and soap out of the inner ear and do not put any object inside the ears.
- ✓ **Wash your feet every day**, especially if you walk barefoot. Scrub them thoroughly with soap, paying special attention to the spaces between the toes. Keep toenails short and clean. Use a separate towel dedicated for drying feet. Wear clean socks and shoes. Never go barefoot into a public toilet.
- ✓ **Do not exchange personal hygiene objects**, such as sponges, brushes, combs, razors, towels.



## 3. Mouth

Hundreds of different types of germs live and multiply in the mouth. Good oral hygiene limits the spread of bacteria that can cause tooth decay, tooth loss, gum disease, ulcers

and other mouth infections. If possible, have a dentist or other health professional check your mouth, gums and teeth once a year.

- ✓ Brush your teeth thoroughly after every meal for at least two minutes. Brush them up and down in a light circular motion, in front, behind and across the top. Remove food particles and dental plaque (film on the teeth).
- ✓ Do not share toothbrushes. Replace your toothbrush several times a year, especially after an illness such as the flu.
- ✓ Use your own drinking glass and eating utensils and wash them after each use.
- ✓ Do not put objects or fingers in your mouth.
- ✓ Do not spit in public places.

## 4. Nose

The nose is also a good place for germs to hide and multiply. Good practices will help limit the spread of germs.

Do **not** use your hands to wipe your nose or for coughing or sneezing; this will spread germs to whatever and whomever you touch. Carry clean paper tissues and use them to blow your nose and to catch coughs and sneezes. Dispose of dirty tissues as soon as possible and wash your hands. If you have no tissue when coughing and sneezing, place your sleeve or arm over your nose and mouth.

## 5. Clothing, bedding and towels

Wearing clean clothes is an essential part of personal hygiene. You and your family will stay healthier by keeping clothing and bedding clean and free from germs.

- ✓ Change underwear and socks daily, or as often as possible.
- ✓ Wear clean clothes; change them regularly. Wash them as they become soiled or smelly. Take your "outdoor" clothes off as soon as you get home and hang them up to air. Avoid sharing clothes.
- ✓ Change bedding once a week or as often as possible. To limit the multiplication of germs it is especially important to change bedding frequently during and after illness.



- ✓ If lice are found, immediately change and wash the bedding, the towels and the clothes of the infected person. Take steps to get rid of lice as soon as possible by using a special shampoo and removing eggs from the hair with a special comb.
- ✓ Use your personal hand and bath towels for drying your hands and body. Dedicate a separate towel for drying feet. Change towels often and wash them in hot water with soap.
- ✓ Kitchen towels are perfect for germ breeding and need to be washed often, preferably separately from other clothes.

## 6. Cuts and wounds

- ✓ Keep cuts and wounds clean, use an antiseptic cleaner when possible.
- ✓ Keep them covered to avoid infection and spreading germs, especially when preparing food and taking care of children.
- ✓ In case of serious, deep cuts and wounds consult a doctor.

## 7. Personal hygiene during menstruation

Girls and women should maintain a high level of hygiene during menstruation to avoid infections.

- ✓ Keep clean by washing or showering more than once a day.
- ✓ Change underwear and clothing as often as necessary, especially when they become soiled.
- ✓ Use clean sanitary pads or cloths and change them frequently (several times a day).
- ✓ Wash hands before and after changing a pad.



# Basic facts about water

**Water is essential** for life and good health. It is a basic element for human survival. Nothing on Earth can live without water. People, animals and plants all need water to live and to grow.

## Water and the human body

Water is one of the most important elements of the human body. It makes up a large part of total body weight. Depending on body size, up to 65% of body mass is water. It is the main component of body fluids and organs.

## Where is all that water?

- All parts of the body contain some water.
- The lungs are about 90% water.
- About 83% of the blood is water.
- Lean muscle tissue is about 75% water.
- About 70% of the brain is water.
- Bone is about 22% water.
- Body fat is about 10% water.



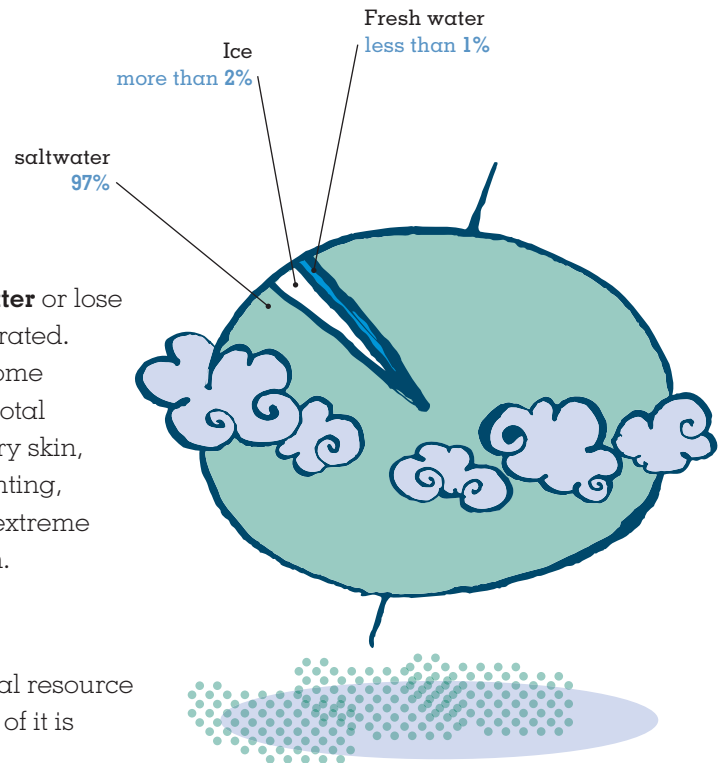
## What does all that water do?

Water plays a critical role in many body functions. It:

- helps carry oxygen and nutrients to cells
- removes toxins from the body
- regulates body temperature
- allows better blood circulation
- helps the body metabolize fat
- helps the body use water-soluble vitamins
- keeps tissues and joints moist
- protects vital organs.

**A person needs** 2–4 litres of clean drinking water a day to replace the fluids lost through different body processes. The amount varies depending on the body size, the physical activity level and the weather.





**When people do not get enough water** or lose too much water they become dehydrated. Dehydration symptoms usually become visible after the body loses 2% of its total water volume. They include thirst, dry skin, dry mouth, dark urine, dizziness, fainting, decreased blood pressure. In some extreme cases dehydration can lead to death.

### Water resources of the Earth

- Water is the most abundant natural resource on our planet. However, over 97% of it is salty seawater.
- Fresh water represents only 3% of all natural freshwater sources and most of it is frozen in ice-caps and glaciers.
- Rivers, lakes, wetlands and groundwater water sources (aquifers) hold less than 1% of all fresh water, which has to provide for the world population.
- Water is a finite resource which cannot be increased nor decreased. The overall amount of water on the Earth – 1 400 million km<sup>3</sup> – has remained the same for millions of years.
- Water circulates in a never ending cycle: it evaporates, rises to the sky, condenses into clouds and falls down to earth as rain, snow or hail.

### Water scarcity

- About 1.2 billion people around the world do not have safe drinking water. Many of them live in arid (dry) regions where the water supply is scarce and rainfall is rare and unreliable.
- Water scarcity can also occur in areas with plenty of freshwater and rainfall. Millions of people face water shortages due to a lack of infrastructure and poor water quality.
- People who suffer most from water scarcity are the world's poor, of whom almost one billion are hungry.

### Health problems related to water

- Water scarcity forces people to rely on unsafe sources of drinking water which can cause many serious diseases carried and spread by contaminated water, such as diarrhoea, cholera, typhoid, dysentery, schistosomiasis and many others. Diarrhoea is the biggest killer of children in the developing world, where 1 out of 6 child deaths is due to diarrhoea.





- About 2 million people die every year from infections spread by unsafe water, lack of toilets and adequate sanitation facilities and poor hygiene.
- Half of the world's hospitalizations are due to water-related diseases.

### Women's work

- In many parts of the world, women and girls have primary responsibility for collecting water for the family for drinking, cooking, hygiene and sanitation.
- Women and girls often spend several hours each day collecting water and carrying heavy containers. In many rural areas, women and girls walk long distances to collect and carry water.
- Carrying water is some of the hardest work done in any community. Carrying heavy loads of water on the back or with a head strap can lead to frequent headaches, backache, joint pain, malformation of the spine, and can cause a pregnant woman to lose her baby due to strain.
- This daily work can leave girls with little time for going to school, studying and learning, playing and resting. It keeps women from other important activities for themselves and their families, such as income-generating work, self-development, child care, recreation and rest.

### Competing water uses

- Water is a shared resource. Farmers need it for irrigation to produce food; industries need it for the production of goods and electricity; people need it daily for drinking, cooking and bathing.
- Most of the world's water is used for growing crops. Agriculture accounts for about 70% of all freshwater use. Industry uses 22% and households about 8%.

#### In the world:

Domestic use

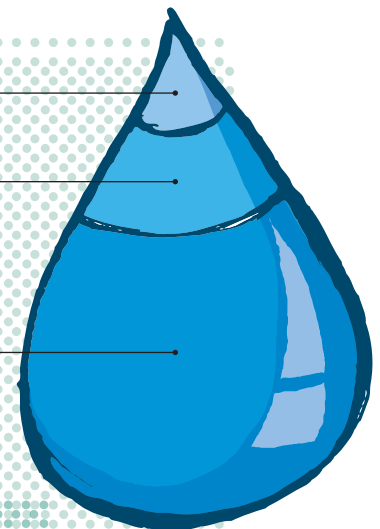
8%

Industrial use

22%

Agricultural use

70%



- When water is used wastefully, there is little left for nature. Half of all wetlands have disappeared over the last century. Some rivers no longer reach the sea. Many fish species are endangered or extinct.

### Water pollution

- Nature continually recycles water and purifies small quantities of waste in the rivers, lakes and seas. But people are polluting water faster than nature can recycle the waste. The world's supply of water is becoming increasingly polluted.
- Runoffs from agriculture fields often contain harmful fertilizers, pesticides, herbicides and animal manure, which pollute the water supply.
- Factories that produce textiles, plastics, medicines, cosmetics and other industrial goods often dump untreated wastes into natural water bodies.
- Cities and towns throw tons of sewage and other human waste into the world's water. More than one billion people openly defecate in or near water sources, a dangerous sanitation practice that contaminates water, encouraging the spread of harmful diseases.

### Water and agriculture

- Without sufficient water, we cannot grow enough food for people to eat. Irrigated land is twice as productive as rainfed cropland. Irrigated agriculture produces 40 percent of the world's food on 20 percent of arable land.
- It takes 1 000 to 3 000 litres of water to produce just one kilo of rice and 13 000 to 15 000 litres to produce one kilo of grainfed beef.
- With the population expected to reach 9 billion people by 2050, the challenge for agriculture is to grow more food with less water.
- Agriculture can become a leader in the world's efforts to conserve water for future generations. Water can be saved through rainwater harvesting, wastewater recycling, drip irrigation, less deforestation, planting of trees, use of natural fertilizers and pesticides.



# Water facts matching

How much do you know about water?  
Are you drinking enough water every day?  
Is your water safe? See if you can match  
each water fact with its correct ending.

1. All people, animals, and plants...
2. A person needs to drink...
3. When people do not drink enough water...
4. 1.2 billion people worldwide...
5. 2.4 billion people worldwide...
6. Contaminated water and poor sanitation...
7. Every day 4 000 children...
8. The water supply must be protected from...
9. Water is safe to drink...
10. To make sure water from lakes, rivers and ponds is safe to drink...
11. Boiling water for a few minutes...
12. Water is never safe to drink or to use for bathing and irrigation...

- A. ...it must always be boiled or chlorinated before drinking.
- B. ...leaking latrines, sewer pipes, rubbish, chemicals and other contaminants.
- C. ...when it is polluted with toxic chemicals.
- D. ...they become dehydrated.
- E. ...destroys most types of germs that can cause disease.
- F. ...2-4 litres of fluids a day.
- G. ...when it is either protected and constantly tested, or treated before use.
- H. ...do not have proper sanitation facilities for waste and sewage.
- I. ...can cause diarrhoea, cholera, typhoid, hepatitis and other serious diseases.
- J. ...die from infections spread by dirty water or the lack of toilets.
- K. ...need water to live and be in good health.
- L. ...do not have clean water.



Answer key: 1K, 2F, 3D, 4L, 5H, 6I, 7J, 8B, 9G, 10A, 11E, 12C.



# Easy ways to make water safe to drink

Water should be treated before drinking if there is any chance that it has been contaminated by:

- surface runoff
- leaking latrines and sewer pipes
- rubbish dumps
- dirty buckets, dirty cups and dirty ropes lowered into the water
- dirty hands
- clothes washing
- animals.

Water with toxic chemicals is never safe to use.

## Settling water

When water settles, solid matter and germs sink to the bottom. Settling water will reduce the number of germs and make water safer, but it does not make the water completely safe and free from germs. Settling water must be followed by disinfection, such as boiling the water or using chlorine.

### To settle water

1. Fill a clean container with water.
2. Cover the top and let it settle for a few hours.
3. Pour the water slowly into a clean empty container, making sure not to disturb the sediment (solid matter) at the bottom. Leave the sediment at the bottom of the bottle you are pouring from.
4. Pour out the sediment and dirty water left in the bottom and wash the container thoroughly.

## Filtering water

Filtering removes many, but not all germs. It must be followed by disinfection that makes water safe to drink.

### Cloth filter

1. Let water settle in a container so that solid material sinks to the bottom.
2. Make a cloth filter out of clean fabric. (It can be used fabric, as long as it is clean.) Fold the cloth 4 times and stretch or tie it over the mouth of a clean water jar or container.



3. Pour the water slowly into the jar through the cloth. Always use the same side of the cloth.
4. After using the cloth, wash it and leave it in the sun to dry.

### Charcoal filter

1. Make holes in the bottom of a container.
2. Grind charcoal to a fine powder and rinse with clean water. Activated charcoal works best, but ordinary charcoal will work almost as well. Never use charcoal briquettes.
3. Place layers of stones, gravel or sand in the container. Place a thin cloth and a layer of charcoal on top.
4. Pour water into the filter and collect the water from the bottom container.
5. Remove and clean the charcoal often.

## Boiling water

Boiling water kills most types of germs that can cause disease.

1. Filter or settle the water before boiling.
2. Boil the water vigorously for at least one minute. In high mountain areas boil water for at least 3 minutes.
3. Let it cool to room temperature. Do not add ice.
4. Store boiled water in a clean container with cover used only for water.
5. To improve the flat taste of boiled water, you can add a pinch of salt or aerate it by pouring it back and forth from one clean container to another and allow it to stand for a few hours.

## Chlorinating water

If boiling is not possible, water can be disinfected using chlorine. This will kill most bacteria and some viruses that can cause disease.

**Tip:** *Chlorine works much better in warm water.*

You can use regular non-scented household chlorine bleach (5.25%) or chlorine tablets. The amount of chlorine needed to disinfect water depends on how contaminated the water is. The more germs there are, the more chlorine you need to get rid of them. It is important to add enough chlorine so that some is left in the water after the germs are killed. Treated water should smell and taste only just slightly of chlorine.



**When using liquid chlorine bleach**

1. Filter or settle the water to make it clearer so that it will disinfect more quickly.
2. For each litre of water add 2 drops of household bleach.
3. Shake gently or mix with a clean spoon. Cover and let it stand for 30 minutes before using it. The water should have a slight chlorine smell.
4. If it does not, repeat the process and allow it to stand for an additional 15 minutes. If the treated water has too strong a chlorine smell or taste, pour it from one clean container into another several times.
5. Store treated water in a clean container with cover used only for water.

**When using chlorine tablets**

1. Follow the tablet instructions, if available. When instructions are not available, use one tablet per litre of water.
2. Allow the water to stand for 30 minutes before drinking.

## Solar disinfection

Disinfecting water by using the sun's rays is a simple and effective way to treat water. It requires only sunlight and a bottle, but it takes longer than chlorine disinfection. It works best in places where there is a lot of sunshine and in countries close to the equator. The farther north or south of the equator you are, the more time is needed for disinfection to work.

1. Clean a clear plastic or glass bottle or plastic bag.
2. Filter or settle the water to make it clearer so it will disinfect more quickly.
3. Fill the bottle  $\frac{3}{4}$  full, and shake it for 20 seconds to add air bubbles to the water. Then fill the bottle or bag to the top. The air bubbles will help to disinfect the water faster.
4. Place the bottle in an open place where there is no shade and where people and animals will not disturb it, like the roof of a house.
5. Leave the bottle for at least 6 hours in full sun, or 2 days if it is cloudy.



# Health problems from unsafe water

## Problem

### Diarrhoeal diseases

Diarrhoea, dysentery, cholera and typhoid are caused by germs carried by human waste, insects, unsafe water and food. Diarrhoea can be a sign of worm infections.

### Guinea worm

A long, thin worm that lives under the skin. It looks like a white thread and can be over a metre long. Guinea worm is found in Africa, India and the Middle East. Guinea worm is spread by infected people who walk into water. The worm pokes out of an open sore and lays eggs in the water. Another person drinks the water and swallows the worm eggs. Some of the eggs develop into worms under the skin. After a year, a worm breaks through the skin to lay eggs.

### Blood flukes (*Schistosomiasis*)

Blood flukes are tiny worms that cause *Schistosomiasis*, also known as snail fever or bilharzia. They multiply inside snails and are most commonly spread in fresh water where there are many snails. The snails carry the worm eggs that have been deposited by infected people urinating or defecating in or near freshwater rivers, lakes and streams.

## Signs and effects on the human body

The most common sign of a diarrhoeal disease is frequent, watery stools. It may be accompanied by fever, headache, trembling, weakness, vomiting. Knowing what treatment to give depends on the kind of diarrhoea:

- **Cholera:** diarrhoea like rice water, severe intestinal pain and cramping, vomiting.
- **Typhoid:** fever, severe intestinal pain and cramping, headache, constipation or diarrhoea.
- **Giardia:** diarrhoea that appears greasy, floats and smells bad, gas and burps that smell like rotten eggs.
- **Dysentery:** bloody diarrhoea, fever, severe intestinal pain and cramping.

The common sign is a painful swelling on the leg or elsewhere on the body. After a few days a blister forms which soon bursts open and forms a painful sore. This often happens when standing in water or bathing. The end of a Guinea worm can be seen poking out of the sore. The worm works its way out of the body over the next week. If the sore gets dirty or if the worm is broken by trying to pull it out, the pain and swelling spread and walking becomes impossible.

Common early signs are a rash or itch. Later signs are chills, fever, diarrhoea, blood in the urine or bloody stools. Sometimes there are no early signs. In areas where this is very common, people with only mild signs should be tested.

*Schistosomiasis* can cause serious damage to the liver, bladder, kidneys and lungs.

Continued



**Problem****Water and HIV/AIDS**

HIV/AIDS is NOT passed from person to person through water. HIV makes people more vulnerable to water-related illnesses. Lack of water for washing and sterilizing health care instruments in hospitals and health centres can make prevention of spreading the HIV virus more difficult.

**Exposure to toxic chemicals**

Toxic chemicals can enter water in many different ways. Runoffs from fields pollute water with harmful fertilizers and pesticides. Industrial plants release chemical waste into water sources. In some areas toxic chemicals are naturally present in soil and rocks.

Toxic chemicals are usually invisible. The only way to detect them is to test water at a laboratory. The only way to ensure that water is free of toxic chemicals is to prevent chemical contamination at the source.

**Signs and effects on the human body**

When people's bodily defences are weak from HIV, diarrhoeal diseases are more likely to affect them and it is much harder to recover. People taking drugs for HIV may have complications when taking other drugs to treat diarrhoea and worms. Children infected by HIV are especially vulnerable. Worms that might not be life-threatening for people who are otherwise healthy can cause pneumonia if they travel into the lungs of HIV-infected people.

Drinking water polluted with toxic chemicals can lead to various diseases including cancer, changes in the bone structure, inborn deformities and immune system damage.



# How clean is my water

**IS YOUR WATER SAFE TO DRINK?** Conduct a survey at home and record on the work sheet with a ✓ everything you and your family do to keep your water clean. Review your habits and make a plan to improve the quality of your water and protect your family from diseases spread through contaminated water.

Yes If no, how can you improve the situation?

## Protecting water sources

- never urinate and defecate in or near water  .....
- build latrines far from your water source  .....
- keep animals out of the water and do not let them urinate or defecate in or near water  .....
- never throw any waste into the water  .....
- fix any leaks as soon as possible  .....
- cover the water source to protect it from dirt  .....
- do not use soaps, detergents, shampoos or cleaning solutions in or near water sources  .....

## Collecting water

- wash hands with soap before collecting water  .....
- use clean buckets and ropes to draw the water  .....
- never step into the water while collecting it  .....

## Storing water at home

- store water in covered containers  .....
- clean containers and water bottles regularly  .....
- clean drinking cups  .....
- keep water containers off the floor  .....
- keep containers away from animals  .....
- never store drinking water in containers that have been used for chemicals  .....
- dry up all water spills  .....

Continued




Yes  If no, how can you improve the situation?

**Making water safe to drink**

- settle or filter water before disinfecting it  .....
- disinfect water by boiling or chlorinating  .....  
when there is a risk of contamination

1. Is your water safe to drink? Yes  No
2. Do you protect your water source from germs and worms? Yes  No
3. Do you collect water in a proper way? Yes  No
4. Do you store water correctly? Yes  No
5. Do you know how to make water safe to drink? Yes  No
6. In what ways can you improve the quality of your water?

.....  
.....

 **For information** on disinfecting water by boiling or adding chlorine check Fact sheet *Easy ways to make water safe to drink.*



# How good is your community water supply?

**Collect all the information you can on the water supply in your community through your own observations and investigation and by interviewing knowledgeable people, experts and local authorities. Find out where the water comes from, if it is clean and safe and if there is enough water for everyone.**

What are the responsible authorities doing to make sure that everyone has access to enough water? How do they make sure that the water is safe for people to use?

Investigate and discuss these issues and decide what the local authorities, community leaders, families and individuals can do to protect and improve the water supply.

**Prepare a report or presentation with the results of your investigation and analysis; include suggestions for improvements and actions that can be taken.**

## Your investigation should include:

1. identifying any problems in the provision of safe, clean water to the community;
2. explaining how these problems affect people's health and daily lives;
3. evaluating or rating the provision of water in the community;
4. making suggestions for actions to improve the situation through efforts by individuals, families and community authorities.

## Examples of interview questions:

- Where does the water in your community come from?
- Is that source clean and safe? Is the water enough for everyone in your community? Is it available all year round?
- What steps are taken to protect that source from contamination? Is there a local authority responsible for testing the water supply?
- How is the water delivered to houses, schools and hospitals?
- If the water is supplied through pipes, how old are the pipes? Are there any leaks? Who is responsible for fixing the leaks and other maintenance jobs?
- Have there been any cases of water contamination? Have there been any cases of disease caused by contaminated water? How were people's health affected? How are these problems dealt with? Who deals with them?
- Do people in the community know that drinking unsafe water can cause serious diseases? Who should inform them about the health risks of dirty water?
- How could the water supply be improved?
- What are the difficulties in improving it?
- Who should be taking action to improve this basic service to the community?





# Clean living conditions: true or false?

Check your understanding of  
some basic facts about clean living  
conditions...

	True	False
1. Clean living conditions, sanitary toilet facilities and proper waste disposal are essential for our health.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Human and animal faeces contain many germs and must be disposed of quickly and safely.	<input type="checkbox"/>	<input type="checkbox"/>
3. If there are no community facilities, there is no way that people can dispose of their toilet waste safely.	<input type="checkbox"/>	<input type="checkbox"/>
4. Dust is not real dirt and does not affect our health.	<input type="checkbox"/>	<input type="checkbox"/>
5. Poorly kept rubbish dumps do not contribute to the spread of disease as long as they are kept far from people's homes.	<input type="checkbox"/>	<input type="checkbox"/>
6. Diseases related to poor sanitation are not among the major causes of death in any country.	<input type="checkbox"/>	<input type="checkbox"/>
7. To limit the spread of germs and protect our health it is especially important to keep food preparation, storage and eating areas clean.	<input type="checkbox"/>	<input type="checkbox"/>
8. Hand-washing facilities with clean water and soap should be provided near all toilets and latrines.	<input type="checkbox"/>	<input type="checkbox"/>
9. There is no safe way to treat or re-use hazardous household waste.	<input type="checkbox"/>	<input type="checkbox"/>
10. Keeping the places we live in and the spaces around us clean and free from harmful germs is just as important for our health as keeping our body and our water clean.	<input type="checkbox"/>	<input type="checkbox"/>

★ The Fact sheets **Basic practices for a clean and safe home** and **Basic practices for a clean and safe community** will help you answer these questions.



Answer key: 1 True, 2 True, 3 False, 4 False, 5 False, 6 False, 7 True, 8 True, 9 False, 10 True

# Basic practices for a clean and safe home



## DO NOTs

**Never defecate in the open.** Faeces contain many very harmful germs. They may be washed away by rain and contaminate wells, streams and the surrounding areas. Flies will feed on faeces and pass the germs onto surfaces and food.

**Do not accumulate rubbish in or near your home.** Germs, insects and rodents will breed and multiply in the rubbish.

**Never throw rubbish into rivers and lakes.** It contaminates water and spreads disease to other people who use these water sources.

**Do not dump hazardous household waste in the environment or leave them in the open.** These contain dangerous chemicals that can pollute the soil, water and air. It is dangerous, illegal and puts all community members at risk.

**Do not keep animals and birds inside the house.** It is especially important to keep animals away from food and cooking areas and from drinking water.

**Do not let water collect or stand near the house.** Empty containers left uncovered can fill with rainwater, encouraging mosquito breeding and attracting flies and other insects and animals.



## DOs

**Use sanitary toilet facilities at all times.**

Clean and disinfect the toilet often and regularly. If there is no toilet or latrine, dispose of your sewage properly, including children's faeces and nappies. Bury your waste immediately, far away from your home and other people's homes.

**Dispose of your household rubbish quickly and correctly.** Sort it out for recycling, composting or burying and take the rest to the communal containers or directly to the rubbish dump. Get rid of your household rubbish and trash as often as possible.

**Dispose of your household chemicals, such as paints, pesticides, batteries and certain cleaning solutions, at specially designated sites.** Toxic chemicals must be collected by trained staff and treated properly. Contact your local authorities for advice and information.

**Keep domestic animals and birds in a separate area outside the home.** Remove and bury their waste safely, away from houses and water sources, or use it as fertilizer.

**Drain any areas of stagnant water.** Dry all water spills. Cover water containers or turn them upside down. Cut grass or weeds to prevent mosquitoes and other insects from breeding. To reduce exposure to mosquitoes that cause malaria, put nets over beds and cover windows and doors with mesh screens.

Continued



**DO NOTs**

**Do not let dirt build up in the house.** It is especially important to clean the kitchen, food preparation area and bathroom or toilet facility areas often.

**Never use the same cloth, sponge or mop** to clean the bathroom, kitchen, the floor and the cooking area. This can spread germs from one place to another.

**Do not inhale chemical cleaning products.** Do not allow the chemicals to get into the eyes, nose or mouth. If the product is past the expiry date or if there are no instructions on the packaging, do not use it.

**Never mix chemical cleaning products.**

**Do not accumulate dust and smoke.** A dusty environment and poor circulation of fresh air can lead to respiratory and eye infections and can be dangerous for people with allergies, asthma and other breathing problems.

**DOs**

**Clean your house regularly.** Keep food storage and preparation areas clean and free from waste. Wash all surfaces with soap and clean water or with antiseptics and disinfectants. Clean toilet and bathing facilities very often.

**Use different cleaning cloths and equipment for different rooms and areas and replace them regularly.** When finished cleaning, wash the cloths, sponges, mops and leave them out to dry.

**Handle chemical cleaning products with great care.** Keep them in locked cupboards, out of reach of children. Follow instructions on the packaging. Wear gloves when using products such as bleach. If a chemical spill occurs, immediately wash yourself and seek medical help.

**Keep the house free from dust and change the air frequently.** Dust the furniture and other surfaces. Sweep and wash the floors. Shake out carpets and rugs. Air your bed mattress, blankets and pillows.



# Basic practices for a clean and safe community



**What should communities do to keep the environment clean and safe from germs?**

All public places - schools, hospitals, markets, restaurants and common places where people gather - must be kept clean and free from rubbish and trash. They should have clean toilet facilities, with soap and clean running water for hand-washing.

Trash and rubbish dumps should be kept far from people's homes and from the water supply.

**Why should communities organize rubbish collection?**

Communities should organize proper rubbish removal to protect people's health. Waste collection reduces exposure to disease, improves the environment and provides employment to community members.

**How should communities remove their rubbish?**

Rubbish must be disposed of in a sanitary manner. Communal containers should be located in the residential areas for people to dispose of their household rubbish. It is particularly important to provide enough containers in public places (markets, schools, hospitals, stations) where large numbers of people come together and prepare, sell and eat food. All waste from communal containers should be collected several times a week and taken to the disposal site. It must be done by trained staff wearing protective clothing.

**Where should rubbish dumps be located?**

Rubbish dumps should not be located close to a water source, because bacteria can spread into groundwater or surface water sources. Dumps can cause disease if not properly constructed and treated to prevent the spread of germs. Dumps should be fenced off to prevent animals from scavenging and carrying rubbish to houses or other places. Waste should be covered every day with 10 cm of soil. When the pit is full the waste should be covered with a final layer of soil to prevent pests from breeding.

**How should medical wastes be treated?**

Medical wastes such as dirty bandages, needles, used syringes and medicines, are a particular health risk of the community. They require special handling and disposal. Medical waste needs to be treated, disinfected, burned or safely buried by trained staff with proper equipment.

*Continued*





**How should slaughterhouse waste be disposed of?**

Slaughterhouse waste contains decaying animal carcasses, blood and faeces and must be immediately disposed of in special sites. Local health authorities must inspect the slaughterhouses to make sure they follow proper procedures for waste disposal.

**What should a community do with industrial waste?**

Industrial waste contains toxic chemicals (for example: mercury, arsenic, heavy metals) that pose health risks for the community and pollute the environment. If industries, such as tanneries and mines, are located in the area, environmental agencies should be consulted on how to dispose of their wastes properly. While it may not be possible for the community itself to set up disposal areas for industrial wastes, it is important that community members recognize the risk and request support.

**How should toxic chemicals be handled?**

Many chemical cleaning products, pesticides and fertilizers can be harmful if not handled and stored correctly. They must be collected by trained staff wearing protective clothing, gloves and a breathing mask. They must be disposed of at special sites to avoid leaking into the soil and contaminating drinking-water supplies. All communities should have local authorities who are responsible for the proper disposal of toxic waste.



# Home inspection

**Is your home clean and safe?** Or could it be putting your health at risk?  
**Record** with an ✓ or ✗ everything you and your family do to keep your home clean and free from germs on a daily, weekly or seasonal basis.  
**Review** your habits. Then **make a plan** to improve your household hygiene.

Cleaning tasks	Daily	Weekly	Seasonal	Never done before, but will do now
<b>1. Kitchen</b>				
Wash dishes, pots, pans and utensils with soap or dish detergent and hot water				
Clean the food preparation area - countertops, table, stove, kitchen sink - with soap and hot water				
Remove kitchen and cooking rubbish				
Clean inside and outside the cupboards				
Clean inside and outside the fridge and the freezer				
Clean the oven				
Change dish towels and aprons				
Sweep the floor				
Wash or mop the floor				
<b>2. Bathroom</b>				
Clean the sink or hand-washbasin				
Clean the shower or bath				
Clean and disinfect the toilet				
Wash or mop the floor				
				Continued



**Cleaning tasks**

**Daily**

**Weekly**

**Seasonal**

**Never done  
before, but  
will do now**

**2. (cont.) Bathroom**

Remove trash

Make sure sewage is disposed of properly

If there is no toilet or latrine, immediately bury  
faeces in an appropriate place

Dispose of dirty nappies safely

**3. Bedroom**

Make your bed

Air the mattress; keep it clean and hygienic

Shake out or wash pillows and blankets

Change soiled bedding and clothes, store and  
wash them properly

**4. All the rooms**

Change air

Empty bins, take the rubbish out and dispose of it  
properly

Dust furniture and other surfaces

Sweep or vacuum-clean floors

Wash floors, clean all the spills and sticky spots

Wash and disinfect trouble spots: rubbish bins,  
door knobs

Clean walls and ceiling, remove cobwebs

Check for pests (flies, cockroaches, bedbugs,  
ticks), get rid of them as soon as possible

*Continued*



Cleaning tasks	Daily	Weekly	Seasonal	Never done before, but will do now
----------------	-------	--------	----------	------------------------------------

**4. (cont.) All the rooms**

Wash windows

Wash curtains, shades or blinds, if any

Shake out or vacuum-clean carpets and rugs, if any

Wash cleaning cloths, sponges, mops and leave them out to dry

Change sponges, cloths, mops, brooms and other cleaning equipment

**5. Outdoors**

Keep the yard clean and free from rubbish

Cut the grass

Plant trees

Cover any water containers or turn them upside-down

Dry up any areas of standing water

Keep domestic animals and birds in a separate area outside the home

Remove and bury animal faeces safely

- What are your household chores?
- Do you think you are doing enough to keep your home clean and free from germs?
- Do you know where the dirtiest places in your home are?
- In what ways can you improve your household hygiene?
- Discuss with your family, make a common plan and try to follow it.





# Investigation: How clean and safe is my school?



**Use these questions to inspect your school.** Is it clean and pleasant to go to? **Discuss** these questions with your classmates and teachers and decide what can be done **to improve** your school sanitation and hygiene.

## Classrooms

- Is your school clean and tidy? Yes  No
- Are the classrooms cleaned daily? Yes  No
- How well are they cleaned? .....
- Who is responsible for cleaning the classrooms? .....
- On average, how many students are there in every classroom? .....
- Are the classrooms big enough for the number of students? Yes  No
- Are there enough desks and seats for all students? Yes  No
- Are the classrooms aired frequently? Yes  No
- Is it often too hot or too cold in the classrooms? Yes  No
- Is there enough natural light? Yes  No

**Suggestions for improvement** .....

.....

## Toilets and hand-washing

- Are the toilets sufficient for the number of students in your school? Yes  No
- Are there separate toilets for girls and boys? Yes  No
- Are the toilets cleaned regularly? Yes  No
- Who is responsible for cleaning the toilets? .....

*Continued*



(cont.) **Toilets and hand-washing**

- Is there toilet paper? Yes  No
- Are there hand-washing sinks in or near the toilets? Yes  No
- Is there always enough clean water for hand-washing? Yes  No
- Is soap always available? Yes  No
- Are students' hands checked for cleanliness? Yes  No
- Do students know that dirty hands can cause serious diseases? Yes  No
- Are the toilets separated from the kitchen and eating area? Yes  No
- Were there any cases of diarrhoeal diseases among students? Yes  No

**Suggestions for improvement** .....

.....

**Rubbish**

- Do students use bins to throw away their rubbish? Yes  No
- Where does the rubbish go? .....
- Is it burned or buried on the school grounds? Yes  No
- Is it collected from the school site? Yes  No
- Is it recycled? Yes  No
- Does the rubbish sometimes build up and attract flies? Yes  No
- Are there any pests (cockroaches, rats, flies) in your school? Yes  No
- What steps are taken to get rid of them? .....

**Suggestions for improvement** .....

.....

*Continued*



**School yard**

- Is your school yard clean? Yes  No
- Is it fenced? Yes  No
- Is the grass cut to keep down insects? Yes  No
- Are there any trees in the school yard and surroundings? Yes  No
- Are there any areas of stagnant water where mosquitoes can breed?  
Can they be removed? Yes  No

**Suggestions for improvement** .....

.....

**School cleaning**

- Who is responsible for school cleaning and safety? .....
- What cleaning materials are used? .....
- What cleaning materials are needed? .....
- What can your school do better to keep its environment clean and safe? What can you and your classmates do to improve your school conditions? .....
- .....
- What can teachers and parents do? .....
- .....
- What can your local community do? .....
- .....
- What positive effect on students' health can these improvements have? .....
- .....
- .....



★ Use the **School Canteen Inspection** work sheet to continue your investigation and to inspect the eating area in your school.



How clean is my community? (cont.)

(cont.) **Sanitation**

- Are there hand-washing facilities in public toilets? Yes  No
- Were there any cases of diseases caused by poor sanitation in your community? .....

**Suggestions for improvement** .....

.....

**Pests**

- Are mosquitoes, flies and other insects common in your area? Yes  No
- Are there stagnant bodies of water? Yes  No
- Are there any cases of diseases caused by insects? Yes  No
- If malaria is a problem, do people use mosquito nets and cover the windows and doors with screens? Yes  No
- Are there many rats, mice and other rodents? Yes  No
- Are there any cases of diseases caused by these rodents? Yes  No
- What steps are taken to prevent these diseases from spreading? .....

**Suggestions for improvement** .....

.....

**Animals**

- Are animals allowed in public buildings? Yes  No
- Are there separate fenced areas for any cattle in your community? Yes  No
- Where and how are the animals slaughtered? .....
- How does your community dispose of the slaughterhouse waste? .....

**Suggestions for improvement** .....

.....



How clean is my community? (cont.)

**Cooking and heating**

- What fuel is used for cooking and heating? .....
- Is it safe for people's health? Yes  No
- Where do people cook? .....
- If indoors, how does smoke get out of houses? .....

**Suggestions for improvement** .....

**Chemicals**

- What chemicals are used in your community? .....
- How are they stored? .....
- How are they disposed of? .....

**Suggestions for improvement** .....

**Buildings**

- What construction materials are used to build houses in your residential area? .....
- Are they safe? Yes  No
- Is overcrowding a problem in your community? Yes  No
- What places are overcrowded? .....
- Are public places well-lit and ventilated? Yes  No
- Are there enough windows in the public buildings? Yes  No

**Suggestions for improvement** .....



★ Use the **Food safety inspection** work sheets in Lesson 8 to further investigate your community, your local market, grocery store or street stalls.



**Eating well for good health** is a learning module designed to explore basic concepts of good nutrition, health and healthy diets.

The lessons are meant for anyone who wants to learn how to improve their diets and eating habits. They can be used both inside and outside the classroom by students, teachers, youth or community groups and by individuals who want to learn on their own.

The module is divided into 4 main topics:

1. ***What it means to be healthy and well nourished***; 2. ***What we get from food***; 3. ***How to eat well for good health***; and 4. ***Healthful habits and lifestyles***. The complete module comprises a total of eleven lessons, each of which contains a lesson overview, a set of learning objectives, some questions to think about while reading, reading content, a variety of group and individual activities and key points to remember.

The **activities** and their accompanying **materials**, which include fact sheets, work sheets, exercises, quizzes and community investigations, help learners test and reinforce their understanding of the basic concepts of each lesson and apply their acquired knowledge to their daily lives.



The *Eating well for good health* web version is available on the *Feeding Minds, Fighting Hunger* website at:

[www.feedingminds.org/fmfh/nutritionlessons](http://www.feedingminds.org/fmfh/nutritionlessons)