

# 中学生活与科学

中学科学双语文本教材

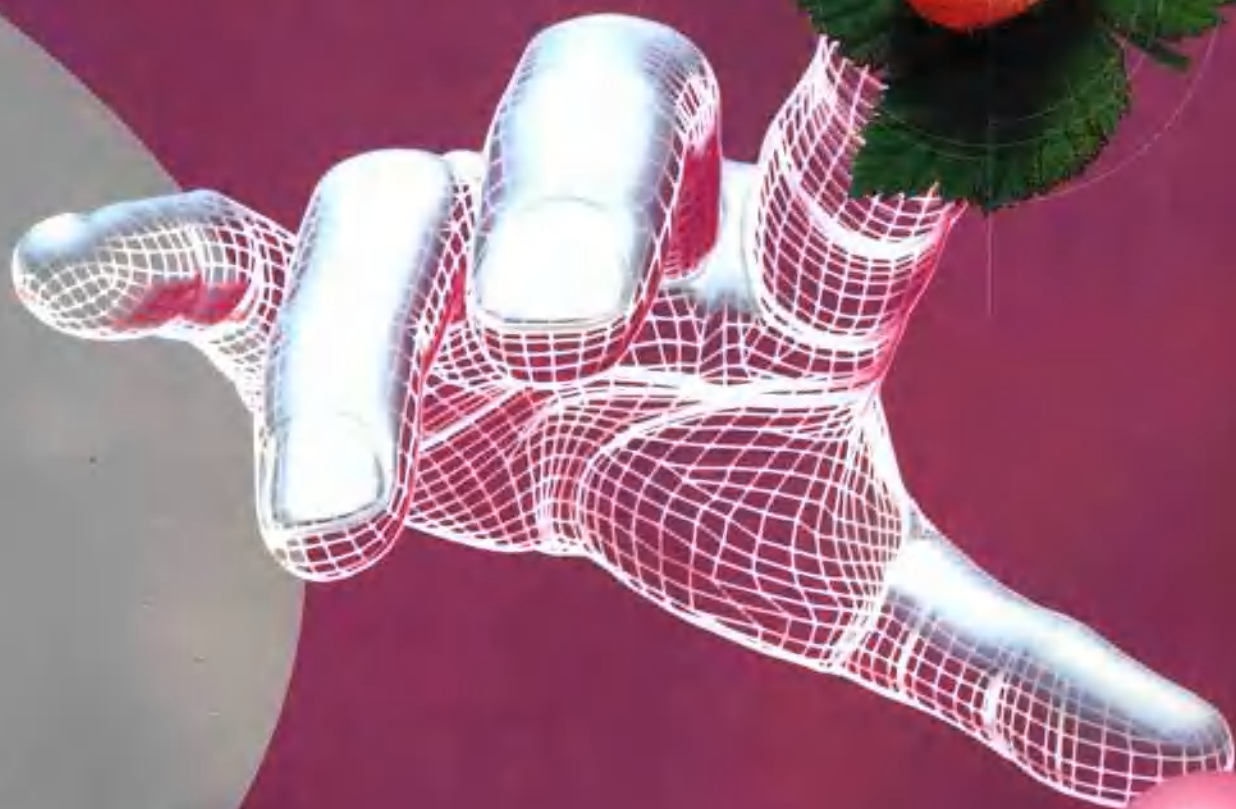
## SECONDARY LIVING SCIENCE

Peter Doyle (英) John Ma Benjamin Yung 著



教师用书

TEACHER'S BOOK



5

外语教学与研究出版社 FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

中学科学双语选修教材

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# 出版说明

在科技日新月异的21世纪,社会的发展对人才的要求越来越高,具备良好的科学素养已成为当今中小學生面临的一项重要的学习任务。为了帮助同学们达到相应的学科要求,并且能够在认识身边的科学、用科学的态度去解决自身学习和实际生活中所遇到的问题的同时,逐步培养起用英语进行思维的能力,我们推出了《生活与科学》(Living Science)。

《生活与科学》中小学系列双语教材的推出,前后经历了近两年的时间。我们在全国率先开设了双语课程的地区进行了多次调研、座谈,并与境外的多家出版机构进行联系,以期寻找最适合我国中小学课堂教学实际的双语教材。我们最终决定引进这套教材,因为其内容非常贴近中小学生的日常生活,强调激发和培养学生的科学探究能力,与教育部颁布的《科学课程标准》提倡的诸多理念相吻合。

为了使教材更易操作,我们对其进行了精心的改编。在中学学生用书中增加了生词的中文注释,但并没有给出英文释义和音标,以免教师步入传统英语教学学单词、抠语法、讲课文的误区;此外,我们还对教材部分内容进行了本土化改编,使教材用起来更加亲切。但是,本套教材改编的力度主要体现在教师用书中。中学教师用书除了保留原书的精华外,还增添了Glossary(词汇注释)、Language Points(语言点注释)、Translation(课文翻译)、Supplementary Reading(补充阅读)等几部分。Glossary部分除了汉语释义外,与学生用书的词汇注释相比,还增添了英文释义,采用了最新的国际音标,以方便教师上课时用英文表述。本着实用的原则,我们对少量用英文释义比较复杂的单词,仅保留了音标和汉语释义。Language Points部分主要是为了帮助教师理解文中出现的比较难的句子。与传统的英语教科书不同的是,这一部分淡化语法,重点解释了一些比较重要的短语。Translation部分则有利于降低原书的难度,为英语教师或学科教师使用该教材提供了一个更易操作的平台。Supplementary Reading则是对学生用书内容的拓展和补充,为教师备课提供了反映最新科技动态等方面的翔实资料。如第一册学生用书的第二十页提到了发明摄氏度的科学家,但限于篇幅,教材并没有具体展开,我们在教师用书中就增加了这位科学家的生平,供教师参考。

参与改编工作的有英语教学方面的专家、沿海地区在双语教学方面有经验的教研员和一线骨干教师。本书编写期间,我们得到了全国各地专家的大力支持,特别是上海市教委的沃振华老师、朱浦老师为本套教材付出了大量的心血,我们在此谨表谢意。诚挚地希望我们的努力能够为我国方兴未艾的双语教学实验注入新的活力;更希望这套教材能为同学们开启一扇了解科学的窗口,使同学们在英语的语境下领悟更多自然界的奥秘,逐步树立起科学的世界观。21世纪需要具备创新意识、较高科学素养和熟练运用英语开展国际交往与合作的复合型人才,我们愿将这套教材奉献给那些勇于承担这一重任的广大师生。

外语教学与研究出版社  
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# 序言

积极推进中小学双语教学实验旨在更广阔的学科领域中、更丰富的语言层面上扩大学习者的英语实践空间,拓展英语教学的外延,深化英语教学的内涵,优化英语习得环境,培养学生英语思维的基本能力,提高学生的英语应用水平和能力。

目前,双语教学在我国的部分省市正在如火如荼地进行。现阶段的双语教学是以学科英语为主,在双语教学中扩大英语输入,促进英语的运用,在确保学科目标基本达到的基础上,以努力培养学生英语思维的习惯为重点任务,提倡培养学习者高效、优质地进行研究性学习,实现英语教学和学科教学的有机整合。但是,在双语教学的开展过程中也出现了一些问题,制约其发展的瓶颈问题就是缺乏适合于不同年级、不同学科、不同层次学习者的双语教材。

外研社组织了有关学科及英语教育专家、学者,根据中小学目前的教学实际,参考和借鉴了国内外先进教材的精髓,权衡各地开展双语教学试点工作的得失,博采众长,群策群力,引进、改编了这套《生活与科学》(Living Science)系列双语教材。这套教材重视学科定位,在语言难度、科学性等方面把握正确,具有鲜明的特色:

首先,它贴近学生的生活与学习实际,着重培养学生学以致用能力,从而实现学生从科学世界向生活世界的回归。第二,文章内容充实,深入浅出。教材中出现的概念多以形象化、通俗化的词语来表述,较少出现专业术语。第三,它强调科学学习过程中激发学生的探究能力,既重结论更重过程。小学教材以活动贯穿内容始终,中学教材在一开始就引入科学的概念及科学探究的步骤,引导学生学科学,用科学,培养学生的观察能力、实验能力、思维能力及自学能力。第四,以知识宽度代替深度。在知识内容方面,本套教材主要涉及生命科学、物质科学与宇宙科学三大领域。在系统地讲解这三大领域的基础知识的前提下,它侧重从更广泛的范围内对课程进行整体构思,学科内容交叉渗透。第五,版面活泼,图文并茂。配备大量精美的插图是本套教材的一大特色,特别是小学教材充分考虑到学生的认知规律,以实物照片和卡通图片相结合,充分调动学生的创造力和想象力。第六,具有开放性。本套教材在学习内容、活动安排、作业与练习、评价等方面给师生提供了选择的机会和创新的空间,同时它还引导学生利用广泛存在于学校、家庭、社会、大自然、网络和各种媒体中的多种资源进行探究性学习,使学生在科学学习的过程中潜移默化地掌握英语,从而达到双语教学的目的。

在此我们衷心希望这套教材中力求体现和首倡的一些教学理念和实践经验,能对我国蓬勃发展的双语教学起到推动作用,也希望教师们能在教学中结合本校双语教学的客观情况,勤于钻研,敢于实践,为双语教学贡献出自己的力量。

《生活与科学》系列教材编委会

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# A Healthy Body

## 健康的体魄

Suggested time: (core) 30 periods (extension) 17 periods

- Objectives:
1. Be aware of the requirements for a healthy body.
  2. Identify the main types of food substances and state their functions.
  3. Recognise the importance of a balanced diet.
  4. Be aware of the substances present in the daily food consumed.
  5. Be able to state the main parts of the digestive system and their functions.
  6. Understand the process of digestion and absorption in our body.
  7. Recognise the pathway of digested food being carried to all parts of our body.
  8. Identify the importance of exchange of materials between blood and body cells.
  9. Commit to establishing eating habits that enhance good health.
  10. Be able to use some common indicators to identify the fitness of oneself.
  11. Recognise the need for exercise and rest.

### Brainstorm

- Key:
1. Carbohydrates, proteins, fats, vitamins, minerals, dietary fibre and water.
  2. Food provides energy for the cells. Different foods contain different food substances which make the cells grow properly and stay healthy.

3. Through the digestion by enzymes and the absorption in the small intestines into our blood.
4. Enough exercise, rest, relaxation and having a balanced diet.
5. BMI, pulse rate and vital capacity.
6. Exercises keep us strong and healthy. Enough relaxation and sleep keep our mind clear, so that we can concentrate on our work.



## Glossary

(P. 1)

**fitness** /'fɪtnəs/ *n.* 健康

the state of being healthy and strong so that you are able to do hard work or sports

**relaxation** /rɪ'læks'eɪʃən/ *n.* 松弛, 放松; 娱乐, 消遣

a way of resting and enjoying yourself

## Language points

(P. 1)

1. How do we make use of food inside our body? 食物在人体内是如何被吸收利用的? make use of 利用
2. How do exercises and relaxation relate to our health? 锻炼和休息与健康有什么关系? relate to 与……相关

## Translation

(P. 1)

观察下列图片。这些人身体健康吗?  
你的身体健康吗?





**集思广益**

- 食物的主要成分是什么？
- 食物在人体内是如何被吸收利用的？
- 有益的营养物质是如何进入人体细胞的？
- 我们如何保持健康、强壮？
- 我们如何衡量是否健康？
- 锻炼和休息与健康有什么关系？

# 12.1 How Do We Keep Our Bodies Healthy?

## 如何保持身体健康?

(P. 2)

**Suggested time:** 2 periods

**Objectives:**

1. Recognise the requirements for a healthy body.
2. Develop a correct attitude towards handicapped people.

**Key:** ① No, he eats too many fatty foods.  
② No, these people are sick.  
③ No, these people drink too much alcohol and smoke.

④ No, this boy is taking illegal drug which is harmful to his health.

(P. 5)



**Aim:** Help students to know more about their health condition and ask students to discuss ways to improve it.

### Glossary

(P. 2)

**lifestyle** /'laɪfstɑɪl/ *n.* 生活方式  
the way someone lives

(P. 3)

**emotionally** /ɪ'məʊʃənəli/ *adv.* 情绪(上)  
地、情感(上)地  
making people have strong feelings or opinions

**handle** /'hændl/ *v.* 处理, 应付  
to deal with something

**stress** /stres/ *n.* 压力, 紧张  
continuous feelings of worry about your work or personal life that prevent you from relaxing

(P. 4)

**handicapped** /'hændɪkæpt/ *adj.* 有残疾的

having serious difficulty using part of your body or mind fully because of injury or damage

**regularly** /'regjʊləli/ *adv.* 有规律地  
at customary/periodic times, for example, every day, week or month

**recover** /rɪ'kʌvə(r)/ *v.* 恢复, 康复  
to get better

(P. 5)

**appropriate** /ə'prəʊpri-ɪt/ *adj.* 合适的, 恰当的  
correct or suitable for a particular time, situation or purpose

## Language points

(P. 3)

1. It is equally important to be emotionally and socially healthy. 情感健康和社交健康也同样重要。  
be equally important to 对……同样重要

(P. 4)

2. Many handicapped people have difficulty in

using parts of their body or mind. 许多残疾人行动不便或有智障。have difficulty in doing sth. 做某事有困难

3. However, they can still lead a healthy lifestyle. 但他们依然可以过着健康的生活。lead a ... lifestyle 过着……的生活

## Translation

(P. 2)

### 12.1 如何保持身体健康?

拥有健康的身体，才能充分享受人生。

健康的身体来自健康的生活方式。观察下列图片，这些人健康吗？

(P. 3)

健康并不仅仅意味着拥有强壮的身体，情感健康和社交健康也同样重要。

拥有了健康的体魄，我们就不容易生病，从而有充沛的精力来做好工作。

我们也要具有情感健康，这样我们才能应对生活中的压力，接受各种挑战。

社交健康有利于建立良好的人际关系。

(P. 4)

许多残疾人虽然行动不便或有智障，但他们依然可以过着健康的生活。

下表中列出了拥有健康身体的必备条件。

食物 获取能量、生长发育和肌体修复都需要食物。	你每天摄入足够的食物了吗？
锻炼 有规律的锻炼能塑造健壮的体魄。	你多久进行一次锻炼？
休息 睡眠有助于放松身体和恢复体力。	你每天的睡眠充足吗？

要点

(P. 5)

健康的身体来自合理的饮食、充分的锻炼和休息。

**Key to exercises in Activity Book** .....

1. F    2. T    3. F    4. F    5. T
6. So that we can handle stress and accept challenges in life.
7. No. Many handicapped people may have difficulty in using parts of their body or mind. However, they can still lead a healthy lifestyle.
8. (a) Breakfast            (b) bread            (c) classmates            (d) vegetables  
(e) Homework            (f) meat            (g) newspaper            (h) 15 minutes  
(i) bath            (j) 8 hours            (k) water            (l) chocolate  
(m) alcohol            (n) smoke            (o) bed

**Supplementary reading** .....

**Mental health**

**P**eople who are mentally healthy also experience stress, frustrations, feelings of self-doubt, failure, and rejection. What distinguishes the mentally healthy from someone who is not mentally healthy is their resilience. Resilience is a person's ability to recapture their sense of emotional wellness within a reasonable time using a variety of coping strategies. For example, if your partner breaks up with you, are you able to overcome this emotionally and eventually start going out with other people?

**Characteristics (of a mentally healthy person):**

- hopeful about opportunities and challenges in life
- persistent in achieving one's goals
- practical/realistic about goals as well as their strengths and weaknesses
- responsible for one's own personal behaviour
- respect one's own needs and the needs of others
- healthy self-esteem/positive self-concept
- healthy self-confidence
- ability to manage stress effectively
- ability to work productively
- support network (family, friends, mentors)
- healthy attitude towards problems and difficulties in life
- seek help/advice when needed.

# 12.2 Food Substances 食物成分

(P. 6)

**Suggested time:** 6 periods

**Objectives:**

1. Be able to identify the main types of food substances.
2. State the functions of food substances.

(P. 6)



## 12.1

**Aim:** Be able to perform tests for glucose, proteins and fats in food.

**Part A**

2.

**Teacher's notes:**

Other types of urine glucose test paper give different colour changes when glucose is present, e.g. from yellow to deep green.

**Key:** 2. pink

3.

Solution	Colour change of the clinistix paper
Glucose solution	Clinistix paper changes from pink to purple.
Peanut oil	No colour change.
Protein solution	No colour change.

**Part B**

(P. 8)

**Key:** 2. yellow

3.

Solution	Colour change of the albusitix paper
Protein solution	Albusitix paper changes from yellow to green.
Peanut oil	No colour change.
Glucose solution	No colour change.

**Part C**

(P. 9)

3

**Key:** At the beginning of the test, you can see translucent spots in each section. At the end of the test, only a translucent spot in the oil section is seen.



Solution	Paper used	Observation	
		Beginning of test	End of test
Glucose solution	Clinistix paper	Pink	Purple
Protein solution	Albusitix paper	Yellow	Green
Peanut oil	Filter paper	A translucent spot appears	Leave a translucent spot



**Aim:** Be able to test for the presence of glucose, proteins and fats in food.

**Key:**

Food	Glucose	Proteins	Fats
Egg	✗	✓	✓
Chicken soup	✓	✓	✓
Ice cream	✓	✓	✓
Milk	✓	✓	✓
Corn oil	✗	✗	✓

(P. 10)

**Teaching tips:**

Teacher can bring in several different food products to teach the students how to read the food labels.

(P. 12)



**Teacher's notes:**

Remind students not to laugh at the swollen abdomen of those children with kwashiorkor because it is great pain to the suffering child. Tell students to cherish what they have.

(P. 17)

**Teacher's notes:**

Remind the students to drink 8 glasses of water every day.



**Glossary**

(P. 6)

**originate** /ə'ri:dʒinənt/ v. 发源; 起因  
to (cause to) begin

**appearance** /ə'piərəns/ n. 外观  
the way someone or something looks to other people

**carbohydrate** /kɑ:bəu'haidreit/ n. 碳水化合物  
a kind of substance which provides us with energy and is commonly found in rice, noodles or potatoes

**fat** /fæt/ n. 脂肪  
a kind of substance which has a higher energy value than carbohydrates and is often found in oil, meat and peanuts

**protein** /'prəuti:n/ n. 蛋白质  
a kind of substance which is needed for growth and repair of our body tissues and is commonly found in meat, egg, and dairy products

**vitamin** /'vitəmin/ n. 维生素  
an essential nutrient which can keep a person healthy

**mineral** /'minərəl/ n. 矿物质  
an essential nutrient which is very important for growth and repair and keeps us healthy

**dietary fibre** 食物纤维  
some indigestible substances which can help the peristalsis in the alimentary canal

**identify** /ai'dentɪfaɪ/ v. 确定; 发现  
to recognise something or discover exactly what it is, what its nature or origin is, etc.

**glucose** /'glu:kəʊs/ n. 葡萄糖  
a natural form of sugar found in fruit

**solution** /sə'lju:ʃən/ n. 溶液  
a liquid containing a solid or gas mixed with it

**clintix paper** 尿糖试纸  
a strip of paper which is used to test for glucose

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**strip** /stri:p/ n. 细长条, 带  
a narrow piece

**albustix paper** 尿蛋白试纸



a strip of paper which is used to test for protein

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**corresponding** /ˌkɒrɪ'spɒndɪŋ/ *adj.* 相当的, 对等的  
matching; related

**respectively** /rɪ'spektɪvli/ *adv.* 各自地, 分别地  
each separately in the order mentioned

(P. 9)

**translucent** /trænz'lu:sənt/ *adj.* 半透明的  
not transparent but clear enough to allow light to pass through

(P. 10)

**essential** /ɪ'senʃəl/ *adj.* 基本的, 必要的  
necessary

**lactose** /'læktəʊs/ *n.* 乳糖  
a type of sugar found in milk, sometimes used as a food for babies and sick people

**sucrose** /'su:kɹəʊz/ *n.* 蔗糖  
the common form of sugar

**starch** /stɑ:tʃ/ *n.* 淀粉  
a white tasteless substance forming an important part of a food such as grain, rice, beans, and potatoes

(P. 11)

**internal** /ɪn'tɜ:nl/ *adj.* 内部的, 内在的  
of or in the inside, esp. of the body

(P. 12)

**tissue** /'tɪsju:z/ *n.* (动植物的细胞)组织  
animal or plant cell, esp. those that make up

a particular organ

**starvation** /stɑ:'veɪʃən/ *n.* 饥饿, 饿死  
suffering or death from lack of food

**swollen** /'swɒlən/ *adj.* 浮肿的  
having got bigger, often because of water or air inside

**abdomen** /'æbdəmən/ *n.* 腹部  
a main part of the body, between the chest and legs

**deficiency** /dɪ'fɪʃənsi/ *n.* 缺乏, 不足  
a lack of something that is necessary

**hinder** /'hɪndə(r)/ *v.* 妨碍  
to prevent

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**papaya** /pə'paɪə/ *n.* 木瓜  
(the large yellow-green fruit of) a tall tree grown in tropical areas

**night blindness** 夜盲症  
reduction in vision in darkness

**formation** /fɔ:'meɪʃən/ *n.* 形成  
the shaping or developing of something

**anemia** /ə'ni:mɪə/ *n.* 贫血  
condition in which the hemoglobin content of the blood is below the normal level

**beri-beri** /ˌberi'beri/ *n.* 脚气病  
a vitamin B-1 deficiency disease in which the legs of the person who is suffering become swollen

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**scurvy** /'skɜ:vi/ *n.* 坏血病  
a disease caused by not eating foods

such as fruit and vegetables that contain vitamin C

**rickets** /'rɪkɪts/ *n.* 佝偻病, 软骨病  
a disease that children get in which their bones become soft and bent, caused by a lack of vitamin D

(P. 15)

**malformation** /mælfɔ:'meɪʃən/ *n.* 畸形  
(the condition of having) a wrongly shaped part, e.g., of the body

**iodide** /'aɪədaɪd/ *n.* 碘化物  
a compound of iodine with another element or group esp. a salt of the anion

**thyroxin** /ðar'roksɪn/ *n.* 甲状腺素  
the main hormone produced by the thyroid gland, acting to increase metabolic rate and so regulating growth and development

**thyroid** /'θaɪrɔɪd/ *n.* 甲状腺  
an organ in the neck that controls growth and activity

**goitre** /'gɔɪtə(r)/ *n.* 甲状腺肿大  
a disease of the thyroid gland that makes your neck very swollen

**hemoglobin** /'hi:mə'gləʊbɪn/ *n.* 血红蛋白  
a protein in red blood cells for carrying oxygen

**phosphorus** /'fɒsfərəs/ *n.* 磷  
a poisonous yellowish element that starts to burn when brought into the air

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**immune system** 免疫系统  
the body system that protects the body from harmful micro-organisms and other foreign

substances

**immunity** /ɪ'mju:nɪti/ *n.* 免疫, 免疫力  
state of being not susceptible to a particular disease

**cereal** /'siəriəl/ *n.* 谷物, 谷类  
(a plant which is grown to produce) grain for food, such as wheat, rice, etc.

**iodine** /'aɪədi:n/ *n.* 碘, 碘酒  
a simple substance that is used in photography, and on wounds to prevent infection

**metabolic** /metə'bɒlɪk/ *n.* (新陈) 代谢的  
of, relating to, or resulting from metabolism

**indigestible** /ɪndɪ'dʒestɪbəl/ *adj.* 难消化的  
(of food) not easily broken down in the stomach into substances to be used by the body

(P. 17)

**intestine** /ɪn'testɪn/ *n.* 肠  
the long tube that takes food from the stomach out of your body

**constipation** /kɒnstɪ'peɪʃən/ *n.* 便秘  
the (medical) condition of being unable to empty the bowels effectively

**constituent** /kən'stɪtʃuənt/ *n.* 成分, 要素  
any of the parts that make up a whole

**dissolve** /dɪ'zɒlv/ *v.* 溶解, 融化  
to make or become liquid by putting into a liquid

**transportation** /træns'pɔ:t'eɪʃən/ *n.* 运输, 运送  
a system or method for carrying something from one place to another



## Language points

(P. 6)

The foods shown in the pictures above are originated from different countries. 以上图片中的食物分别产自不同的国家。be originated from 源自

(P. 11)

1. Fats can be classified into saturated fats and unsaturated fats. 脂肪可以分为饱和脂肪和不饱和脂肪。be classified into 分为

2. Saturated fats cannot be easily broken down in our body. 饱和脂肪不易被人体分解。break down 分解

(P. 12)

1. They are essential for building up new tissues. 它们对于新组织的生成是极其重要的。be essential for 对于……必不可少

2. In some developing countries, many children get kwashiorkor due to protein deficiency. 在一些发展中国家,许多儿童由于缺乏蛋白质而患上了夸希奥科病(一种多见于儿童的恶性营养不良症)。due to 由于

(P. 17)

1. Dietary fibre, combined with indigested food, eventually passes out as faeces. 食物纤维和没被消化的食物一起,最终以粪便的形式排出体外。combine with 和……一起 pass out 排出

2. Water accounts for over 65% of our body weight. 人体内的水分占体重的65%以上。account for (在数量、比重方面)占……

## Translation

(P. 6)

### 12.2 食物成分

我们每天都要摄取食物。在中国,有丰富多样的食物可供选择。

以上图片中的食物分别产自不同的国家。尽管形态各异,但它们都含有我们身体所必需的一些成分,这些成分包括碳水化合物、脂肪、蛋白质、维生素、矿物质和食物纤维。水也是我们饮食中的一种重要物质。

我们无法仅仅从食物的形态、气味或味道来确定其中所含的各种成分,但是我们可以借助一些简单的实验来检测食物中所含的碳水化合物、脂肪和蛋白质。

(P. 10)

各种食物成分的功能

不同的食物成分有不同的功能,它们对人体是至关重要的。在以下的食物标签上你能找到哪些食物成分?

要点

(P. 10)

尿糖试纸可以用来检测葡萄糖。

尿蛋白试纸可以用来检测蛋白质。

滤纸可以用来检测脂肪。