

Learn English for Science

科普英语进阶

提高篇

[英] A.R.Bolitho P.L.Sandler

高等教育出版社

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(英) A.R. Bolitho

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出版说明

《科普英语进阶》是一套通过系统的英语学习,了解、掌握一些最基本的科学知识的教科书。旨在帮助非英语专业、具有中等英语水平学生和具有一定英语基础和能力的自学者,提高运用英语阅读、理解科技资料或书写简单科技报告和论文的能力。同时,通过本套书的学习,可使读者积累一部分科技资料中常见的、基本的词汇与术语,掌握科普知识的英语表达,如科学计量、科学观察分析、科学实验、科学论述、科学预测等方面的常识性知识。

本套书共分为三册:《入门篇》(Start English for Science);《提高篇》(Learn English for Science);《强化篇》(Study English for Science)。三篇形成一门完整的英语课程体系,同时各篇又自成体系,可单独适用于相应水平的读者需求。每篇分为两大部分:Students' book 和 Teachers' book。Students' book 内容包括一些最基本的科学技术原理和普及知识,从《入门篇》至《强化篇》难度、深度循序渐进。每一单元课文后附有大量可激发读者深入学习兴趣和语言反应能力的练习,包括词汇(Words)、课文内容提问(Questions on the Text)、句型与段落(Sentences and paragraphs)、图表理解(Graphs)、补充阅读(Extensive reading)等方面的练习。练习形式多样,可帮助读者进一步理解课文内容,掌握一定数量的科技基本词汇,提高基本的英语阅读和书写能力。Teachers' book 既可作为教师教学参考,也可帮助学生自学和自测。Teachers' book 中给出每一单元学习的重点和建议,以及每一单元中主要练习的答案。书末附有全书词汇表,列出全书每一单元中的主要词汇和术语,并给出每一单词的音标、词性及汉语注释。

本系列丛书可供中等职业学校和高等专科学校作为科技专业英语教材或公共英语课程的辅助教材,也适用于初、中级英语水平以上的读者作为课外科普英语阅读或科技英语阅读的学习读本。

出版者
1999年3月

学习导引

本课程的目的

本课程目的在于帮助教师和学生打破文、理科的界限,并掌握与科技有关的一些基本英语知识。

本课程的科学内容

本课程的课文和练习取材于科技知识而非日常生活,但本课程仍是一本语言方面的教材,而不是科技类教科书。清楚地认识到这一点,将有助于教师进行教学。部分练习需要一点基本的科学常识,如果从一开始,课堂上能培养起一种协作互助精神——老师指导学生学习语言,学生们帮助老师理解课文中的科学内容——那么师生间就能达到一种真正的双向交流。一旦学生意识到可以提供给老师一些新的东西,他们将更乐于学习。

本课程使用的语言

英语语法具有系统性和通用性。某些语法结构,尤其是被动语态,在科技英语中的使用比在生活英语中更为频繁,因此需要加以重视。而有一些语法结构在科技英语中则是不常用的,出现得也相应少一些。词汇也是类似情况。本书对于那些出现频率较高、常用于科技英语的词汇,介绍得详细一些。

学生在学习本课程的同时,需要培养一些基本的能力,以便在科技交流中应用。这些能力是:阅读和理解,阐释和定义,把科学表征形象化,解释表格和图像,以及书写简单报告等。

每一单元的构成

《科普英语进阶·提高篇》(Learn English for Science)为《科普英语进阶》系列教材中的中篇,共分为12个教学单元和3个复习单元。以下为每个教学单元各独立部分的基本要点:

1. 课文(The texts)

这些课文是专门为本课程而编写的,其主题选自不同的自然学科。每篇课文分成几个部分,同时配有插图和图解,以帮助学生理解、掌握词汇和课文涉及到的各个步骤。

在讲解课文时,教师应借助各种方法来把课文阐述清楚——

几幅附加的图画,一些简单的教学模型,一位理科老师的生动、简洁的帮助——上述之一或所有都可用来激发学生的积极性,达到强化理解的目的。教学方法的形式越多样化,效果越好。本课程各单元都列出了建议使用的一些方法。

以下为一篇课文的授课范例:

1) (合上书本)教师用英语讲述本课主题,观察学生是否了解这些内容,运用图画、举例等来介绍词汇(这给学生一个机会来熟悉词汇,并创造出一个关于本主题的基本“氛围”);

2) 当确认学生已“进入”主题,教师再次大声通读课文(此时,学生的书仍合上),就全文大意提一两个简单问题(选自“问题与答案”,或自编);

3) (课本仍合上)教师再次朗读课文的第一部分,并就细节提问;

4) 学生打开课本,默读课文的第一部分,就任何不清楚的地方提问;

5) 课文中的其他部分可按步骤3、4重复。

学生在通篇理解之前,不应大声朗读课文。

2. 词汇 (Words)

包括多种形式的练习。以下这种说法适用于所有形式的词汇练习:词汇只有在整个句子中才有意义。如果学生不能在上下文中使用词汇,让他背记一个单词无异于浪费时间。“词汇练习”部分给出了许多较难词汇在上下文中的例子,教师应努力通过提问来达到考查学生对上下文中的词汇的理解。

教师在准备每个单元的介绍时,会发现“词汇练习”部分很有帮助。学生可以以“词汇练习”为范例,给上下文中的单词、例子下定义。我们尽量在“词汇练习”中包含所有较难的、陌生的词汇。“构词练习”还讲解了某些单词是如何构成的。

3. 问题与答案 (Questions and answers)

包括以口头或书面形式出现的课文理解问题。选择这些问题的目的在于强调课文主题,并鼓励学生为了寻求答案而进行主动学习。这些问题可以在课堂上练习,也可以采用两人或小组的方式进行。

提问这种形式本身有些消极,但如果要想让学生们学会用英

语“交流”,这些问题又很有必要。练习包括一些最普通的问题形式,这些问题在写出答案前应先作口头回答。如果到本课程结束时发现学生已经能很自如地用英语来回答问题,那么本练习的目的也就达到了。有些教师通常习惯于在每节课上插入几分钟的“回答问题时间”。

4. 句子和段落(Sentences and paragraphs)

本练习是为解决造句和语法问题而设的。在科技类文章的上文中,动词时态较之文艺类文章有所不同,在出现介词的地方也都已加以注释。在写作练习指导中,各个写作要点都列在一起,其目的是为了使学生在学完本课程后能书写较短的、结构符合逻辑的段落,这也是一个科学家必备的书写科研报告的第一步。

本课程包含很少甚至几乎没有任何语法现象的描述。其理由如下:作为一名教师,你需要了解这门语言——它的作用及其依据;而这个层次的学生需要的仅是知道这门语言——会熟练地听说、使用。目前,大多数人仅“知道”英语,却不会“说”英语。如果教师需要一些教学方面的指导,Teachers' Book 中包括了一些简要的语法注释,但不是严格的语法规则。

5. 数字、符号、量和单位等(Numbers, symbols, measurements, etc.)

在科技书籍的书面交流中,并不仅仅限于单词的使用。在本练习中,对数字、符号、量和单位作了解释、例举及动词化。本练习的目的在于为学生在用英语正确地使用数字、符号、量和单位等方面打下一个坚实的基础。

复习单元

此类单元为一些常见问题如介词、动词短语(这些词的用法不如动词时态易分类)等设了大量练习。同样包括人们喜爱的填字游戏和可用以自测的理解练习。复习单元同样具有信息反馈作用。如果学生在复习单元中做得不好,教师应该在新课开始之前再复习一下已学过的单元。

Teachers' Book 的作用在于为教师在准备材料和练习方面提供帮助,同样也给出了各个练习答案的简单的解释。

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封面设计 王凌波
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Contents

Students' Book

Unit 1	How do scientists work?	3
Unit 2	Classification	10
Unit 3	The power of water	19
Unit 4	Water power	25
Revision unit 1	(Units 1 – 4)	32
Unit 5	Two vital elements	35
Unit 6	Water pollution	42
Unit 7	Jet propulsion	48
Unit 8	Our neighbours in space	55
Revision unit 2	(Units 5 – 8)	63
Unit 9	The uses of mathematics	68
Unit 10	The weather	74
Unit 11	The power of the lens	83
Unit 12	Rocks	91
Revision unit 3	(Units 9 – 12)	99

Teachers' Book

Introduction	107
Unit 1 How do scientists work?	110
Unit 2 Classification	111
Unit 3 The power of water	113
Unit 4 Water power	115
Revision unit 1 (Units 1 – 4)	117
Unit 5 Two vital elements	117
Unit 6 Water pollution	118
Unit 7 Jet propulsion	120
Unit 8 Our neighbours in space	121
Revision unit 2 (Units 5 – 8)	122
Unit 9 The uses of mathematics	123
Unit 10 The weather	125
Unit 11 The power of the lens	127

Unit 12	Rocks	129
Revision unit 3	(Units 9 ~ 12)	132
附:词汇表		135
专有名词		140

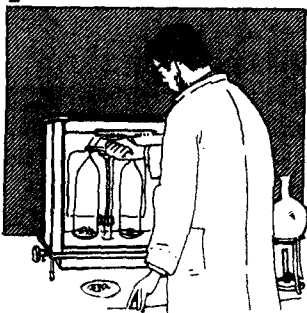
STUDENTS' BOOK

UNIT 1 How do scientists work?

1 We can all observe simple scientific facts about the colour of the sky, the temperature, or the depth of a river at different times of the year. The scientist's task is to ask questions about these observed facts and to find answers to these questions. He usually bases theories on his observations and then tests his theories by practical experiment. He often uses special apparatus to help him to make observations and to carry out his experiments.

Look at these pictures of scientists at work in their laboratories:

2



This man is a chemist. He is using a balance to weigh some copper sulphate crystals. Beside him is the apparatus which is used to make the crystals. Copper sulphate (CuSO_4) is composed of three elements – copper, sulphur and oxygen. It is a compound. Compounds are substances which consist of two or more elements. Chemists not only analyse compounds but also combine elements to form compounds.

3



This man is a physicist. He wants to find out something about the colours in the spectrum. He is using lenses and a prism to produce these colours from a beam of white light. Physicists study not only light but also sound, heat and electricity.

4



This woman is a biologist. She is using a microscope to examine a blood sample. She wants to find out the number of red blood cells in the sample. She can only see these cells through a microscope because they are so small. A microscope is an instrument which magnifies very small objects. A biologist studies all forms of life and often needs the help of a microscope. Some living things consist of only one cell.

WORDS

WORD STUDY

observe (1): When we observe the moon through a telescope, we look at it closely and try to find things out about it.

depth (1): The depth of a river is greater in the middle than near the sides. A bad swimmer should never go out of his depth.

bases on (1): builds on. Darwin's Theory of Evolution was based on observations of animals in many parts of the world.

theories (1): ideas which explain, or try to explain, facts or events.

apparatus (1): Remember that this word is uncountable and has no plural. Lenses and prisms are pieces of apparatus.

consist of (2): are made up of. Water consists of hydrogen and oxygen.

analyse (2): If a chemist analyses a compound, he breaks it down; he finds out which elements it consists of.

spectrum (3): the different colours which light consists of.

examine (4): look at very closely and carefully.

sample (4): a small amount of a substance, usually taken for testing.

cells (4): the smallest living units. All living things consist of cells. The smallest living things consist of only one cell. They are single-celled.

magnifies (4): Microscopes and telescopes are instruments which magnify. They make things seem bigger.

WORDS IN COMBINATION

Look at these examples



These cells are found in blood. They are *blood cells*.



These crystals consist of copper sulphate. They are *copper sulphate crystals*.

1. Now complete these sentences in the same way

- a) This assistant works in a **laboratory**.
He is . . .



b)



Joe studies physics.

He is . . .

c)



Mrs Evans teaches biology.

She is . . .

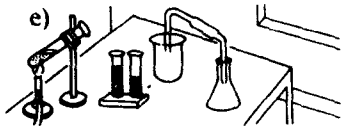
d)



This is a sample of rock.

It is . . .

e)



This laboratory is used for chemistry.

It is . . .

WORD BUILDING

2. Fill in the missing word in each pair. The first one has been done for you.

<i>The scientist</i>	<i>His science</i>
a) a biologist	biology
b) a physicist	. . .
c) . . .	chemistry
d) a mathematician	. . .
e) a geologist	. . .
f) a technologist	. . .
g) . . .	botany
h) . . .	zoology

QUESTIONS AND ANSWERS

1. Answer these questions

a) What does a scientist usually base his theories on?

- b) How does a scientist test his theories?
- c) What does a scientist often use instruments for?
- d) What does a scientist often use apparatus for?
- e) What does copper sulphate consist of?
- f) What sort of substance is copper sulphate?
- g) How many elements does water consist of?
- h) What do physicists study?

2. *Here are some answers. Make a question for each one, using the words in brackets.*

- a) To weigh some copper sulphate crystals. (What . . . for?)
- b) To make the crystals. (What . . . for?)
- c) To produce the colours in the spectrum. (What . . . for?)
- d) To examine a blood sample. (What . . . for?)
- e) There are copper sulphate crystals on the balance. (What sort of . . .?)
- f) Water is a compound. (What sort of . . . ?)
- g) Oxygen is an element. (What sort of . . . ?)
- h) She is looking at blood cells. (What sort of . . . ?)

SENTENCES

PRESENT TENSES

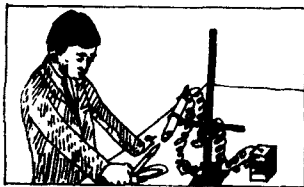
Look at this example

Peter/biologist/laboratory → Peter is a biologist. He *works* in a laboratory.

1. *Now make similar pairs of sentences from each group of words below*

- a) Marie/chemist/chemistry laboratory
- b) Frank/geologist/university
- c) Tom/mathematician/with numbers
- d) Mr Clark/technologist/with computers
- e) Mrs Evans/biology teacher/school
- f) John and Ann/laboratory assistants/with apparatus
- g) Rita and David/botany students/with plants

Look at the picture and the example



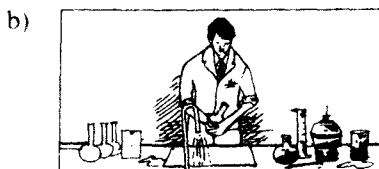
chemist/do/experiment →

This man is a chemist. He *is doing* an experiment.

2. Now make similar pairs of sentences for each picture



biologist/look through/
microscope



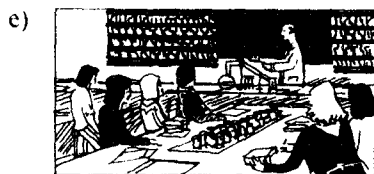
laboratory assistant/wash/
apparatus



biologist/test/blood sample



geologist/analyse/rock sample



students/observe/experiment



mathematician/use/computer

3. Now answer these questions

- What does Tom work with?
- Where does Mrs Evans work?
- Where does Frank work?
- What is the laboratory assistant in the picture doing?
- What is the geologist in the picture doing?
- What is the biologist in picture (c) doing?

THE PASSIVE

Look at the verb in this example

Copper sulphate *is composed* of three elements.

4. Use verbs in the same passive form to complete these sentences

- Water (compose) of hydrogen and oxygen.