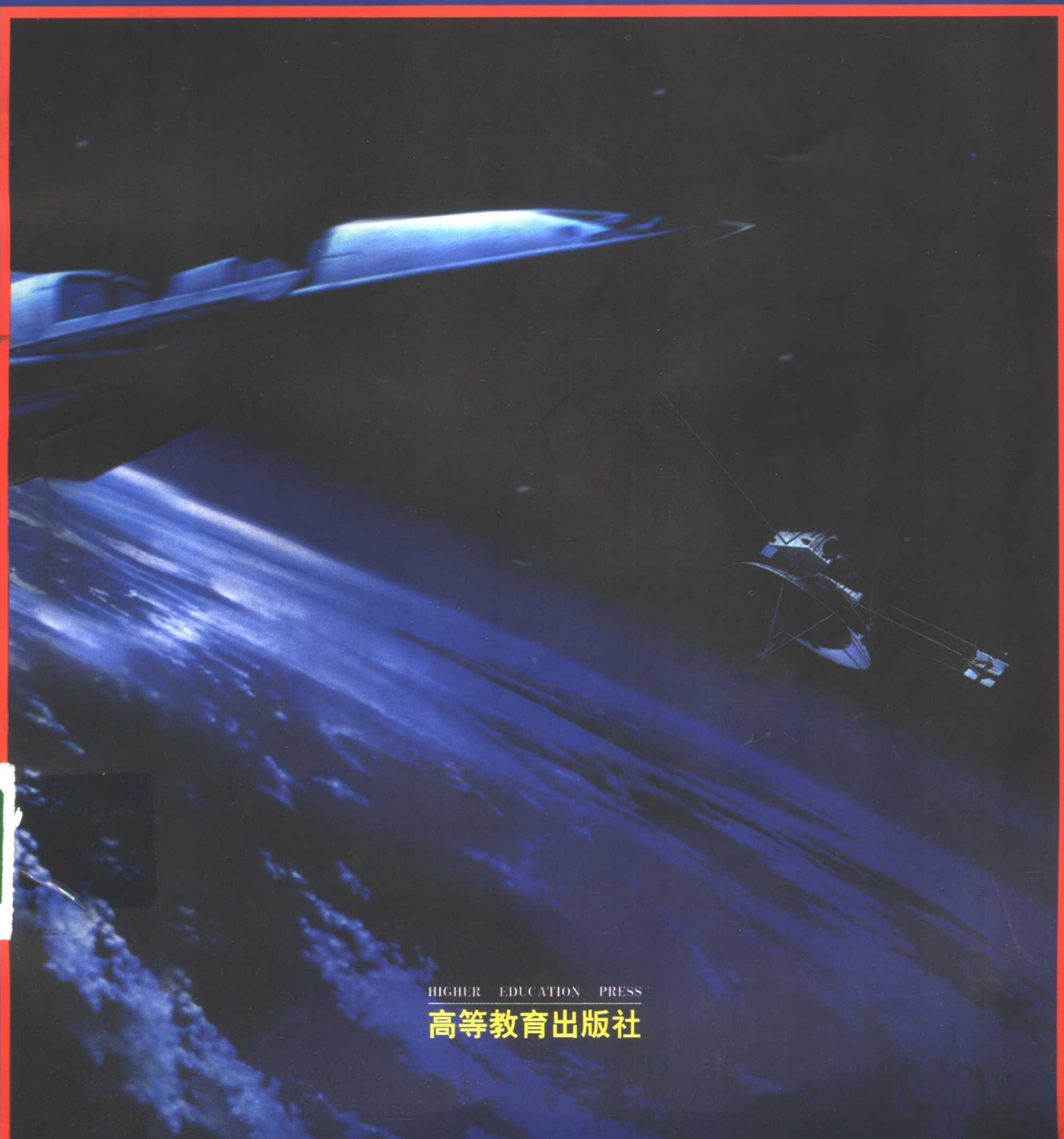


高等学校大学英语专业阅读阶段教材

NEW SCIENCE TEACHER'S BOOK  
ENGLISH 教师用书

# 新科技英语

东南大学中英《新科技英语》教材项目组



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(京)112号

**图书在版编目(CIP)数据**

新科技英语: 教师用书 / 中英《新科技英语》项目组编.

北京: 高等教育出版社, 1997.6

ISBN 7-04-005983-5

I. 新… II. 中… III. 英语—高等学校—教学—参考资料  
IV.H31

中国版本图书馆 CIP 数据核字 (97) 第 08694 号

\*

高等教育出版社出版

北京沙滩后街 55 号

邮政编码: 100009 传真: 64014048 电话: 64054588

新华书店总店北京发行所发行

中国科学院印刷厂印装

\*

850×1168 1/16 印张 15.75 字数 420 000

1997 年 5 月第 1 版 1997 年 5 月第 1 次印刷

印数 0 001—1 104

定价 28.80 元

凡属高等教育出版社的图书, 如有缺页、倒页、脱页等

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# 前言

<<新科技英语>> (New Science English) 是由国家教育委员会与英国政府海外开发署共同商定的文化交流项目之一。该项目由国家教育委员会领导、英国政府资助、东南大学主持, 历时三年, 现已圆满结束。在此, 我们十分高兴地将此成果推荐给大学英语专业阅读教学的同行们。

<<新科技英语>> 是根据国家教育委员会颁布的<<大学英语专业阅读阶段教学基本要求>>编写的第一套新型教材。主要供我国工科高等院校非英语专业的专业英语阅读教学使用, 也可供其它类型的高等院校进行科技英语阅读教学时采用。

这一项目在设计上, 针对我国大学英语专业阅读阶段教学的薄弱环节, 旨在促进我国大学英语专业阅读阶段教学的发展, 特别是在进一步提高学生阅读理解能力和综合分析的能力、习惯科技词汇、开阔科普视野和思路、了解科技文体、掌握<<大学英语专业阅读阶段教学基本要求>>所规定的学习技能、语言技能和基本词汇, 进一步提高学生运用英语的能力, 以满足日益增长的国际科技交流与合作的需求。

该项目共分五个阶段实施:

- 一、大学英语专业阅读教学的调研与需求分析。
- 二、编写大纲设计、教材编写与试用。
- 三、教材修订与再次试用。
- 四、项目的总体评估。
- 五、教材的出版与推广。

自1995年9月起, 本教材在东南大学先后进行了两轮大面积的试验教学与修订, 并相继在西安交通大学、重庆大学的部分教学班进行了试点。这些试验教学由中方教师(包括外语系教师和专业系科的教师)与英方教师共同执教、共同收集和分析反馈信息, 对教材进行修改。

该教材在编写上力图全面贯彻<<大学英语专业阅读阶段教学基本要求>>的精神, 因此较全面地覆盖了“基本要求”所规定的学习技能、功能意念、词汇和其他教学要求。

在进行了学生调查的基础上, 教材精选主题。课文内容涉及世界科技发展的最新领域, 并反映典型的科技文体的表达形式。

在练习编写上以学生学习为中心, 全面地培养学生读、写、译的能力。特别值得一提的是, 在阅读练习的设计上增加了阅读过程的指导。课文右边给出一定的单词注释和设计一些阅读提示性问题, 使学生阅读过程中得到正确的引导和帮助。此举在学生的反馈意见中, 得到了积极的反应。

此外, 本教材还配有一本详尽实用的教师手册, 以帮助任课教师理解本书的编写意图, 解决一定的语言和文化障碍, 更好地组织课堂教学。

需要说明的是, 考虑到本书为语言教材, 为保持选文及有关例句的原有风格, 对本书中所使用的非国际标准单位均未予改动。

1997年3月由邵永真、吴银庚、韩其顺、郭杰克、程恩洪、刘龙根等六位教授组成的大学外语教学指导委员会评审组对该教材进行了评审。并作出了积极、充分肯定的评价。他们一致认为这

是一部目的明确、符合“基本要求”、实用性强的好教材。它题材多样，语言规范、真实，反映了世界最新科技发展的动态。

这一项目历时三年，得到了各方的支持和关心。在此我们要特别感谢国家教委高教司外语处负责人岑建君、外语处前处长张序义，英国驻华大使馆英国文化教育处的官员John Hilton, Babara Wickham 和Jim Banks。东南大学国际交流处、教务处、外语系的领导也给予了本项目很多的帮助。我们还要感谢西安交通大学外国语学院、重庆大学外国语学院的领导和同行们给予此项目的大力支持。在本书出版之际，我谨代表中英<<新科技英语>>项目组向所有关心和支持过该项目的所有人员表示由衷的感谢。

尽管在本书的编写中我们尽了最大的努力，但恐难免做到尽如人意。我同时也希望广大的教师在使用本教材的过程中对本教材不断提出宝贵的意见。

中英<<新科技英语>>项目组主任

邹长征

1997年4月于东南大学



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## PART ONE: INTRODUCTION

### 1. GENERAL INTRODUCTION

When teachers use a new book for the first time, they usually have a lot of questions. We would suggest you take a little time to read through the *New Science English (NSE)* student's book, then return to this introduction. We hope that at least some of your questions will be answered below.

*What is the major aim of New Science English?*

Its major aim is to develop reading and writing skills for post Band-4 non-English majors at universities and colleges of higher education.

*Do we really need another reading and writing textbook? Surely students who have passed CET 4 want to develop their speaking and listening skills.*

This is an important question. Early in 1995, a needs and wants analysis was conducted at Southeast University, Nanjing, with questionnaires to over 500 undergraduates and postgraduates. The results were very interesting. For years 1, 2 & 4, listening and speaking were indeed the top priorities for over half the students surveyed. Of the third year students, over 50% regarded listening as a medium level priority, and over 50% put vocabulary development as their first or second priority. Vocabulary development and writing were seen as medium level priorities by around 70% of students from all the other years. The priority accorded to reading showed the greatest variation over the four years. Only 20% of first year students put it as their first or second priority; this figure increased to almost 50% in the second and third years, and decreased to just over 30% in the fourth year. Throughout the four years, grammar was assigned the lowest priority by the vast majority of students.

What is equally significant is that 76% of the first year postgraduates who completed the questionnaire rated reading as the most frequently used skill; writing and speaking were both ranked in second place by 40% of the respondents, while 82% considered listening the least frequently used skill.

*So New Science English is an intensive or extensive reading course?*

We don't really think the distinction between 'intensive' and 'extensive' is a particularly helpful one. We had two main criteria in mind when we selected the texts: they should be interesting, with new information for the students; and they should lend themselves to language exploitation. So some of the tasks that the students do would more usually be found in an intensive reading course, while the overall approach is probably closer to extensive reading.

*How were the core reading texts chosen?*

The topics of the texts are those which students in their questionnaire responses said they would be most interested in – information science, space technology, architecture, environmental engineering, and so on. The texts are taken from magazines of popular science, newspapers, and journals published in Britain, the US, New Zealand and China. So the original readership is the educated layman interested in scientific subjects.

*Because most of the core reading texts are from journals and magazines, doesn't this mean the information will very soon be out-of-date ?*

These texts will certainly date much more quickly than ones dealing with, say, the classical laws of physics or the properties of certain chemical substances. But then the skills development exercises also have to reflect changing principles and approaches in ELT. Therefore future editions of *New Science English* will update both texts and tasks.

*Do articles written for the educated layman reflect the kind of reading the students will have to do in real life; won't they be more concerned with specialist papers and textbooks?*

That is partly true, but we should bear four things in mind. Firstly, *New Science English* is a bridging course between the very general EFL reading that leads up to CET 4 and the specialised reading courses offered by many of the students' own departments. Secondly, we hope the book is going to be used by students from a wide variety of scientific and technical disciplines; so the texts cannot be too specialised. Thirdly, around sixty percent of the postgraduates we surveyed reported that they regularly read journals, magazines and newspapers in English. And finally, the supplementary reading texts are drawn from a wide range of sources, including academic conference proceedings, encyclopedia entries, college textbooks, and so on.

*But the topic of Unit 15 is science fiction! How do you justify that in an EST textbook?*

We feel our task as language teachers and textbook writers is primarily to meet the evolving language learning needs of the students, and this can best be done by presenting them with texts that are intrinsically motivating and interesting to read. If we can give students a sense of the excitement and discovery that is possible when reading in a foreign language, and equip them with the skills needed to understand such texts, we are fulfilling our teaching role more effectively than if we simply try to simulate their future reading requirements.

*Have the texts been simplified?*

No, they are unsimplified, because we wanted to preserve their authenticity. However, most of them have had to be shortened.

*Doesn't that raise serious problems of vocabulary and general background knowledge that will be unknown for most students?*

Yes it does, but we have tried to develop ways of overcoming these problems. With two exceptions, only texts which contained less than 5% of words outside the Band 4 syllabus were chosen; for this purpose, *The High Frequency Vocabulary Book*, compiled according to the National College English Teaching Syllabus, and published by Higher Education Press & Shanghai Foreign Language Education Press, was used. Textual difficulty in terms of the number of words outside Band 4 is given in the table below.

Unit: Core Reading Text	Total word count	Words outside Band 4	Percentage of new words
Space Technology	1064	31	2.9
Information Science	1065	31	2.8
Everyday Science	1100	40	3.6
Sports Science	969	51	5.2
Electrical Engineering	1080	32	3
Transportation Engineering	854	26	3
Architecture	966	35	3.6
Military Science	1096	38	3.5
Environmental Engineering	1120	38	2.9
Food Technology	922	41	4.4
Biological Science	737	51	6.9
Science Fiction	972	30	3.1
Mid-semester Exam	1082	28	2.6
Final Exam	715	15	2.1

Chinese translations of all the words and phrases that are not included in the Band 4 syllabus are given in the right hand margin of every text.

*And every meaning of each word is given?*

No, just the meaning in context.

*Doesn't that limit the students' language learning?*

No: very few words have one fixed meaning irrespective of context. We feel students are more likely to remember the new vocabulary if the Chinese translation is related to the context in which it occurs.

*But why do you give the meanings in Chinese? Surely students at this level should be encouraged to use English-English dictionaries.*

Encouraging the use of English-English dictionaries is certainly a valuable study and language learning skill. But when a student is encountering a difficult text for the first time, we want to make the experience as motivating and stress-free as possible. We hope translations of unknown words beside the text will enable students to read more fluently.

*However, if students are given the meaning of all the words outside Band 4, they are prevented from inferring the meaning of unknown words from context, which is surely another valuable reading skill.*

They don't need to infer those words, certainly. But there are a number of lexical items that can be exploited in this way. For example, in **Unit 2, Vocabulary Development Task 1: Words in Context** asks students to work from the known to the unknown: some words that appear in Band 4 have derived forms that do not, so students have to use their own knowledge plus context clues to work out the unfamiliar words and phrases. The tasks that accompanies the **Supplementary Reading Text** in **Unit 10** also requires the inferring of meaning from context.

*To fully understand a new word or phrase, of course, the student needs more than simply the Chinese equivalent.*

That is true, and at the back of the student's book there is a selective glossary of some of the most important new words and phrases. The glossary, which is cross referenced, provides a phonemic transcription, the grammatical word class, a definition, and a contextualised example for each lexical item.

*However, a text's 'difficulty' doesn't just depend on the number of unknown words. What about all the cultural background and general scientific knowledge that an author assumes he shares with his readers?*

We have tried to partly overcome this problem with detailed teacher's notes. Areas of difficulty may remain, but we do feel that the students will gain considerable satisfaction from successfully coming to grips with authentic English texts that present new and interesting ideas and information.

*But if the information is so new, how can ordinary English teachers, and even subject specialists who are teaching English, teach it?*

Of course there are going to be occasions when the students know more about a particular subject area than the teacher; in this case, we encourage the teacher to exploit that 'information gap', and get the students to explain the key ideas – a very valuable language learning activity. Then there will be times when the subject matter is new for everyone – there are texts on genetically engineered vegetables and an evolutionary approach to robot design, for example, that no one is going to know much about. We hope the background notes and the various reading tasks will guide both teacher and students through these unfamiliar areas.

*Moving on to the reading tasks: are there any underlying principles?*

Yes: We hope the tasks will promote **active reflective reading**. 'Active' means that there must be a clear sense of purpose for the reading, and the student should have the opportunity to interpret the text and then modify those initial interpretations.

'Reflective reading' is characterised by the student breaking the flow of their progress through a text and reflecting on something they have read about.

*So what does a typical unit look like?*

Each of the twelve reading units has a core reading text, annotated in the margins with Chinese translations and reference questions, and with the same framework of accompanying tasks: **Pre-Reading**, **Global Reading**, and **Detailed Reading**, which all focus on understanding the text, and **Post-Reading**, which is made up of **Vocabulary Development** and **Vocabulary Check** activities and a **Language In Use** section. There is also a supplementary reading text, whose accompanying tasks reflect the question types which are likely to appear in the national post-Band 4 Specialised Reading examinations; the answers to these tasks are at the back of the students' book, and may therefore be used on a self-access basis. Each reading unit concludes with a **Wordbuilder** section, which deals with much of the vocabulary contained in the *Basic Teaching Requirements for College English Specialised Reading Stage* (Higher Education Press 1996) vocabulary list; answers to the **Wordbuilder** tasks are at the back of the book. There are also four writing units, that consist of reading, writing and translation tasks on a certain theme (e.g. formal letters, interpretation of visual data).

Finally, there are model mid-semester and final exam papers at the end of this book.

## 2. USING NEW SCIENCE ENGLISH : CLASSROOM LANGUAGE

Some of the teachers who trialled the first draft of *New Science English* mentioned that they often felt they were ill-prepared to organise their classes through the medium of English; consequently they used Chinese a good deal in the classroom. Of course, in some situations and with particular groups of students it may indeed be necessary to use Chinese to ensure that important instructions or explanations are fully understood. However, using English on a regular basis does help to create an appropriate language learning environment, and gives the students a chance to practice their listening skills. We are therefore listing below some expressions which you may like to make use of as you teach *New Science English*. We have taken **Unit 1** as an example, and have used a fairly informal, friendly tone throughout.

IN THIS SITUATION:	YOU COULD SAY:	CHINESE EQUIVALENT:
<i>Starting the class</i>	Good morning / afternoon, everyone. Let's begin. / Let's make a start.	各位, 早上(下午)好! 让我们开始吧!
<i>Checking attendance</i>	Now, is everyone here? Does anyone know why Fang Hong is absent?	大家都到了吗? 谁知道方红为什么没来?
<i>Introducing the unit</i>	OK, today's topic is space exploration, and in particular we'll be reading about lunar exploration – that is, journeys to the Moon.	好, 今天的话题是太空探索, 特别要谈谈有关月球探索的内容 – 月球之行。



<i>Organising where students sit</i>	Before we begin, please make sure that you are sitting next to someone. Fang Hong – who's your partner?	在我们开始以前,请大家看一下是否和同伴坐在一起。方红,你和谁坐?
<i>Asking students to do a task</i>	Now open your books at page 1 and look at the Pre-Reading Task.	请把书打开到第一页,请看读前练习。
<i>Giving instructions for the task</i>	First, try to complete the task on your own. You have two minutes.	首先,大家自己完成读前练习。时间是两分钟。
<i>Organising pair activity</i>	Now turn to your partner and compare your answers.	现在和你的同伴交换一下答案。
<i>Giving instructions for pair activity</i>	If you and your partner have different answers, go back to the task and try to find out why.	如果你和同伴的答案不一致,请回到课文中寻找原因。
<i>Starting to read the text</i>	Right, I'd like you to read the text silently. As you read, complete the Global Reading Task. Remember, this is a skimming activity, so read through the text as quickly as possible.	好,我请大家默读课文。请边读边完成全文的阅读练习。 记住:这是一项快速阅读练习,所以尽可能快地阅读课文。
<i>Organising group activity</i>	I want you to form groups of three or four. So would all of you on alternate rows turn round and face the people behind.	我想请你们三四人组成一个小组。每隔一排的同学转过身与后排的同学进行讨论。
<i>Asking questions on the text</i>	Would you look at the first paragraph for a moment? In line 4, what does the word 'it' refer to?	请花一点时间读一下第一段。第四行 'it' 指什么?
<i>Organising students' responses</i>	Don't call out the answer. Put up your hand if you think you know.	请不要把答案报出来。如果你知道答案,请举手回答。
<i>Taking a break</i>	Well, it's ten to nine, so let's take a ten-minute break.	好,现在是8点50。我们休息10分钟。
<i>Moving on to the next task</i>	Let's move on, shall we? Please turn to Detailed Reading Task 1 on page 5.	让我们继续,好吗? 请翻到第五页的细读练习一。
<i>Checking students' answers</i>	Let's check what you've written. When will the International Moon Program-me probably start? Fang Hong?	请检查一下你所写的内容。国际月球计划大概将何时开始,方红?
<i>Encouraging peer correction</i>	Would someone like to write up their answers on the board? Now, does everyone agree with this answer? Who's written something different?	有谁愿意将答案写在黑板上? 好,大家是否都同意这一答案?有谁写了不同的答案?
<i>Guiding students to correct response</i>	Well, look at lines 17 to 19 again. What does it say in the text?	请大家再看17到19行。课文中是怎样说的?
<i>Correcting students' errors</i>	No, not two thousand and TWENTY – two thousand and TWO.	不,不是2020,而是2002。