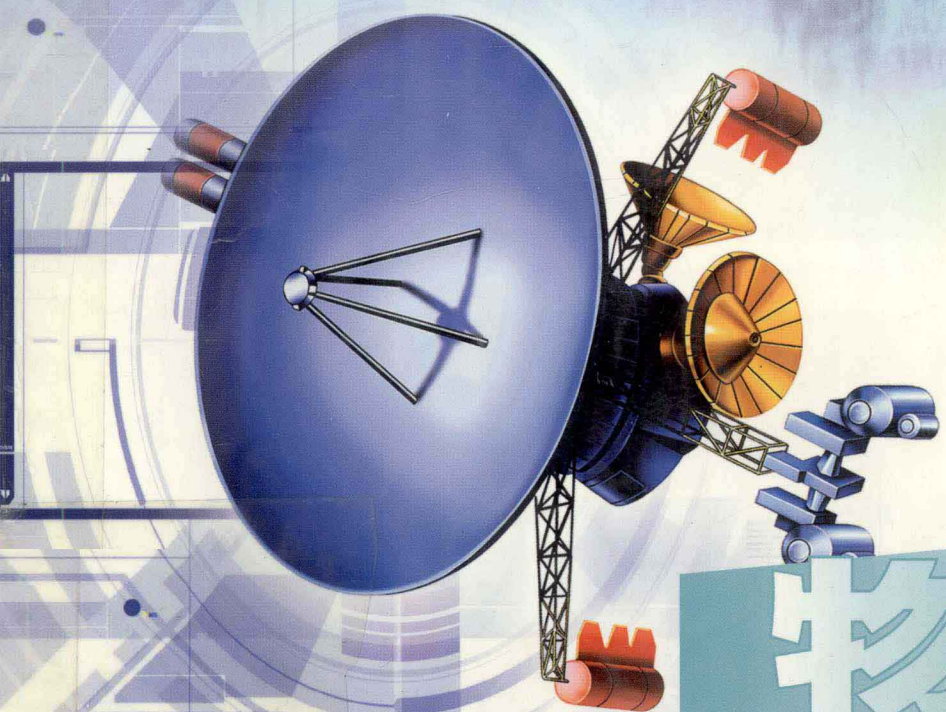
英语版

九年义务教育三年制初级中学教科书

PHYSICS

第一册

课程教材研究所
双语课程教材研究开发中心 组译



物理

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英语版初级中学教科书

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英语版初级中学教科书

说　明

随着改革开放的不断扩大，中国在经济和教育、科学、文化等诸多方面与各国间的交往日益增强，中国人学习英语的热情也日趋高涨。在当今社会，是否熟练掌握英语，已成为衡量一个人的知识结构甚至综合素质的一个重要方面。在这样的形势下，多角度、多渠道提高人们的英语水平，特别是提高基础教育阶段在校学生的英语水平，已经成为社会的迫切需要。

为了适应这种新的形势和需要，从2001年起，作为教育部直属单位的课程教材研究所着手研究开发英语版普通高中教科书（包括数学、物理、化学、生物、历史、地理六门必修课程），已由人民教育出版社出版。随后，又继续开发这套英语版初级中学教科书，将包括初中三个年段的几何、代数、物理、化学、生物、历史、地理和信息技术等。

这套英语版初级中学教科书，根据经全国中小学教材审定委员会2001年审查通过、人民教育出版社出版的《九年义务教育三年制初级中学教科书》编译而成，主要供实行双语教学的学校或班级使用，也可以作为中学生的课外读物，其他有兴趣的读者也可以作为参考书使用，使学科知识的掌握与英语能力的提高形成一种双赢的局面。

为了使这套英语版教科书具有较高的编译质量，课程教材研究所双语课程教材研究开发中心依托所内各学科教材研究开发中心，在国内外特聘学科专家和英语专家联袂翻译，且全部译稿均由中外知名专家共同审校。

我们的宗旨是：以前瞻意识迎接时代挑战，以国际水平奉献中华学子。

人民教育出版社英语版初级中学教科书，愿与广大师生和家长结伴同行，共同打造新世纪的一流英才。

热诚欢迎广大师生和读者将使用中的意见和建议反馈给我们，使这套教材日臻完善。联系方式：

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汉语版初中《物理》第一册

说　明

《九年义务教育三年制初级中学教科书·物理》是根据教育部2000年颁发的《九年义务教育全日制初级中学物理教学大纲(试用修订版)》，在原《九年义务教育三年制初级中学教科书·物理》的基础上修订的，并经全国中小学教材审定委员会2001年审查通过。这次修订，旨在更加有利于贯彻党和国家的教育方针，更加有利于对青少年进行素质教育，更加有利于中学生的全面发展，培养学生的创新精神和实践能力。

初中物理是九年义务教育必修的一门基础课程。学生不仅要通过物理课学到初步的物理知识，获得观察、实验的初步技能。并且要在认识自然现象和学习科学知识的过程中，了解人类如何通过探究自然而推进科学和文明的发展，从而进一步认识物理学在科学技术和社会发展中的重要作用。

物理课要培养学生初步的分析、概括能力和应用科学知识解决简单问题的能力；培养科学探究精神和严谨的科学态度，使学生在探究过程中体会学习的趣味，逐步树立科学的世界观。

本次修订在维持原教材基本框架的前提下，重新研究并修改了某些不适应《九年义务教育全日制初级中学物理教学大纲(试用修订版)》要求的内容；针对初中学生的认知水平和身心发展特点，在教材内容的编排上注意与小学自然课知识的衔接；同时，注重知识的趣味性与科学性的统一、理论与实践的统一。

新修订的教材充实了一些简明易懂、直观形象的示意图和照片，全书图文并茂、色彩明快，为学生的物理学习创设了一个更为宽松、愉快的空间。

这套《九年义务教育三年制初级中学教科书·物理》分为两册，第一册与第二册总课时为164课时，本册是供初中二年级使用的。

教材原试用本由雷树人任主编，董振邦、陈子正、张同恂任副主编，第一册执笔是董振邦、马淑美、王金铮。参加本次修订的有张大昌、彭前程、孙新。责任编辑孙新。插图绘制王恒东、何慧君。版面设计马迎莺。徐荣亮、冯容士、刘雄硕、李本伟、赵谊伶、毛桂芬六位特级教师提出了重要修改意见。

致同学们

同学们：

欢迎你们开始学习物理。

这套初中物理教科书共有两册，本书是第一册。教科书是学习的重要依据。为了帮助你们用好教科书，下面介绍一下本书编写上的一些特点。

每章开头都有两个问题，它们的作用主要是提示这一章的主要内容。

许多节的开头有个大问号，问号后面通过故事、现象或实验提出问题，这些问题或者能激发你们的学习兴趣，或者能启发你们进一步思考。

每节中都有加了花边的小标题。这些小标题可以帮助你们抓住本节的中心内容。

许多节的最后有“想想议议”，如果能够认真地思考、讨论，将会使你们加深理解，活跃思维，并提高表述能力。

有些节的标题上就写着“实验……”这是要求同学们自己动手做的。许多节的课文里还列出了一些实验，这些实验可以由同学们自己做，也可以由教师做，同学们观察。

有些节里安排了小字排印、并用黑线框起来的内容，主要是学习方法上的提示，或者是些有益的或有趣的信息。

每章后面都有供课外阅读的“阅读材料”和课外自己动手做的“小实验”，前者有助于扩展知识，后者有助于提高操作能力。

各章最后的“学到了什么”是这一章的小结，是供总结、复习这一章用的。

书中有大量插图，它们是教学内容的必要组成部分。有些插图形象生动地说明课文的内容，有些插图本身包含了重要的物理知识，应该认真阅读。

祝同学们在学习中不断取得成功。

编　者

CONTENTS

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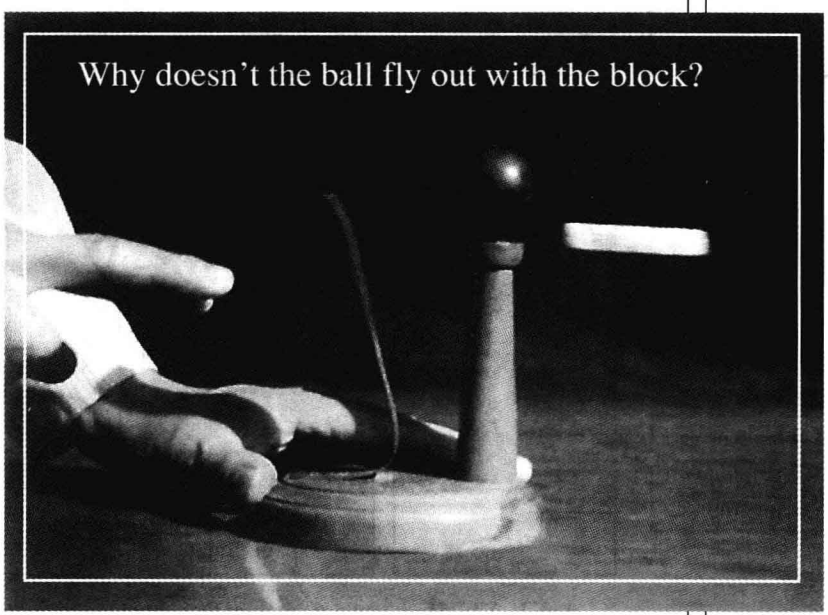
Introduction



1. Is physics interesting?
2. Is physics useful?
3. What should we pay attention to when learning physics?

What is physics

Have you ever noticed the phenomena shown in Figure 0-1? Physics is the study of mechanics, sound, heat, light and electricity. By finding out their causes, we can study how to make use of them to serve the human beings.

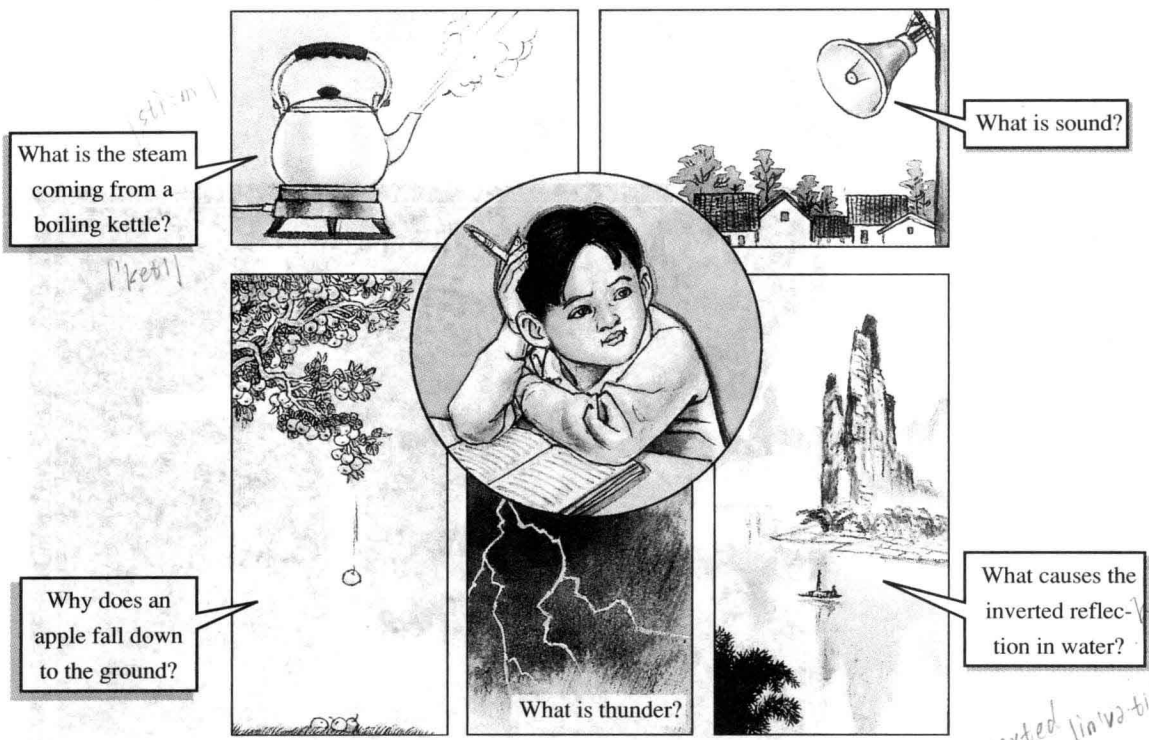


Figure 0-1 Have you ever noticed these physical phenomena?

Physics is interesting

Faced with the various kinds of physical phenomena, we have been full of curiosity and mystery since we are very young. We always regard them as a riddle and want to find the way out. Of these riddles, many will be the objects of this junior-high-school physics course and will be studied in our future classes. However, the physics course is not simply to find the answers to those riddles, but to guide us to investigate and explore them just as the scientists do. In this way, in our physics classes, we can not only feel great excited because of find-

ing the answers to those riddles that have confronted us so long, but also experience the research methodology used by the scientists and feel their happiness in gaining achievements.

The objects to be studied in physics classes, besides those that are familiar but incomprehensible to us, also include many that we haven't ever seen or even thought of, such as the following experiments. Guess what will happen, and then do them by yourself.

Experiments

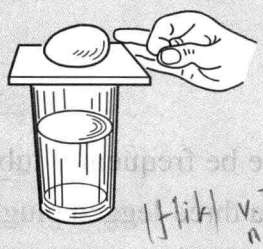


Figure 0-2 Use a finger to flick off the cardboard all of a sudden, will the egg fly out with the paper?

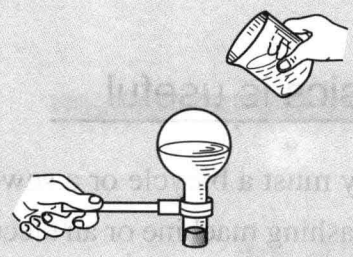


Figure 0-3 Can the cold water make the hot water in the flask boil?

1. Put an egg on a piece of cardboard (Figure 0-2). Then flick off the paper suddenly.

2. Turn over a closed flask that is just moved away from fire and the water in it has stopped boiling (Figure 0-3). Pour some cold water onto the bottom of the flask.

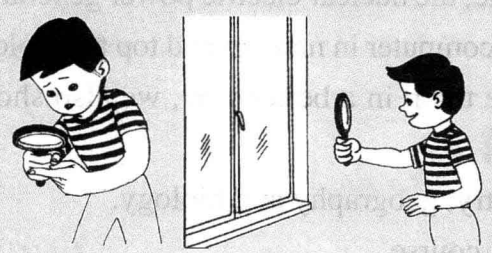


Figure 0-4 Will objects always be magnified when seen through a magnifier?

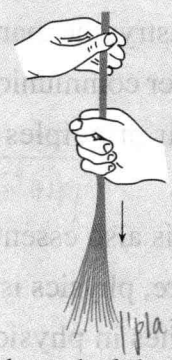


Figure 0-5 Grab a pack of plastic hambro lines dispersed at the bottom and run your hand along the length. Will the more times you do, the more tightly they fold together?

3. Use a magnifier to watch your fingerprint and then use it to watch the objects outside (Figure 0-4).

4. Grab a pack of plastic hambro lines dispersed at the bottom with your clean and dry hand, run your hand along the length several times (Figure 0-5).

These unexpected phenomena imply quite important knowledge of physics. Learn physics, and then you can understand them.

Physics is useful

Why must a bicycle or a sewing machine be frequently lubricated? Why must a washing machine or an electric fan use a three-legged plug? What makes an illuminating circuit or a light not work? To make these phenomena clear and to make better use of the more and more popular machines and electrical equipments in modern life, we should learn physics.

All the followings are developed based on physics research: the gas engine, the electromotor, the seeding-machine and the reaping-machine in industrial and agricultural production; the train, the car, the ship and the plane in traffic transport industry; the man-made satellite, the nuclear electric power generation, the optical fiber communication and the computer in modern and top technology. To know their principles and to utilize them in a better way, we also should learn physics.

Physics is also essential to chemistry, geography and biology.

Therefore, physics is a very useful course.

Researches in physics have made great contribution to our socialist construction of the four modernizations. They enabled us to achieve great success in the field of launching and recovering the man-made satellites and spaceships as well as in the field of top technology such as making the A-bomb and h-

bomb. Hence, it enables us to become one of the few countries in the world that have mastered these kinds of advanced technology.

How to learn physics well

Emphasize observation and experiments Physics is a kind of science based on observation and experiments. Much knowledge of physics is achieved through subtle observation and careful experiments. During physics learning, the learners should observe great phenomena, watch those experiments conducted by the teachers and sometimes do them in person. When observing, the learners should have a clear purpose and pay attention to those causes and conditions that result in changes. When doing an experiment, the learners should possess a strict and honest scientific attitude, conform to the operational rules, record the data truthfully, make analyses and draw conclusions according to the notes. Besides, they should also stress their safety and take good care of the instruments.

Think diligently and put emphasis on understanding Think hard whenever the learners are observing a phenomenon, doing an experiment, reading a book or attending a lecture. The physics learning does not merely mean memorizing a definition or an article. As a learner, he should reach complete understanding, such as how a conclusion is reached, based on what kind of facts and requires and what kind of thinking, what is its relationship with other related knowledge, what is its significance and applications as well.

Stress the applications of knowledge Application is the purpose of learning. Lay a special emphasis on the mode of thinking and the methodology adopted by the textbook and the teachers in solving a problem. Try to use what has been learned to explain simple phenomena, make simple calculations, analyze and solve simple and practical problems.

Only with the help of the aspects mentioned above could the learners learn physics well.

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