



英 语 科普小品



EVERY
SCIENC

EVERYDAY SCIENCE

英语科普小品

北京工业学院外语组编

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编 者 的 话

为了适应大中学生和具有初步英语基础的其他读者提高英语阅读能力的需要,我们编写了这本《英语科普小品》。

本书内容包括化学、光学、热学、电学、力学等方面的理论知识,同时也结合我国工农业、科学技术发展情况编写了一些有关电子学、半导体、计算机、雷达技术和火箭技术等方面的材料。全书共四十九篇,分为十三个单元。每篇短文后面都附有词汇表、语法注解和参考译文,书末附有总词汇表,便于读者查阅。

由于我们水平和经验的限制,编写时间又很仓促,书中一定有不少缺点错误,热忱地欢迎读者批评指正。

本书在编写过程中,承北京首都钢铁公司“七二一”工人大学师生提出许多宝贵的意见,谨表示感谢。

编 者

1978 年



Content

Unit 1	7
1. Energy	7
能	
2. Energy Conversion	10
能量转换	
3. Conservation of Energy	14
能量守恒	
4. Solar Energy Stoves	17
太阳灶	
Unit 2	22
5. The Sun's Family	22
太阳系	
6. The Earth and the Sun Are in Motion	26
地球和太阳在运动中	
7. Stars	30
星球	
Unit 3	34
8. Light (1)	34
光(1)	
9. Light (2)	37
光(2)	
10. Seeing Things	40
观察物体	
11. Laser	44
激光	
Unit 4	50

12.What Is Heat?	50
什么是热?	
13.Heat Conduction	53
热传导	
14.How Heat Travels	56
热是如何传递的	
15.Expansion and Contraction	59
膨胀和收缩	
Unit 5	65
16.Electric Current	65
电流	
17.Resistance	67
电阻	
18.Direct and Alternating Currents	70
直流电和交流电	
Unit 6	74
19.Semiconductors.....	74
半导体	
20.Transistors	78
晶体管	
21.Integrated Circuits	82
集成电路	
22.Application of the Silicon Controlled Rectifiers	86
硅可控整流器的应用	
Unit 7	90
23.Electronics and Its Applications	90
电子学及其应用	
24.Television	94
电视	

25. Something About Radar.....	98
雷达浅说	
26. How A Radar Set Works	103
雷达装置的工作概况	
Unit 8	109
27. New Methods of Computation	109
新的计算方法	
28. Electronic Computer	112
电子计算机	
29. China's New Electronic Computer	116
我国的新型电子计算机	
30. How An Electronic Computer Operates	120
电子计算机是如何工作的	
Unit 9	125
31. Living Without Friction	125
在没有摩擦情况下的生活	
32. Forces Have Both Magnitude and Direction	128
力既有大小也有方向	
33. Inertia	132
惯性	
Unit 10	137
34. Solids, Liquids and Gases	137
固体、液体和气体	
35. Molecular Theory of Matter	140
物质分子论	
36. Physical and Chemical Changes	143
物理变化和化学变化	
Unit 11	147
37. The Chemist's Alphabet	147
化学工作者的字母	

38.The Size of Molecules and Atoms	150
分子和原子有多大	
39.Something About Atoms	154
谈谈原子	
40.Petroleum	158
石油	
41.New Techniques in Chemical and oil Refining Industry	162
化学工业和炼油工业的新技术	
Unit 12	167
42.A Short Story About Rocket	167
火箭的故事	
43.Rocket	172
火箭	
44.How Rockets Operate	175
火箭是如何工作的	
45.Staged Rockets	179
多级火箭	
Unit 13	183
46.Visiting an Exhibition	183
参观展览会	
47.China's Science and Technology Grow Apace	187
中国科学技术在迅速发展	
48.How the BJ-130 Light Truck Was Made.....	191
BJ-130轻型卡车是怎样制成的	
49.The Liuchiahsia Hydropower Station.....	196
刘家峡水电站	
总词汇表	201

Unit I

1. ENERGY

2. When a body is doing work, we say that it has energy. ~~Very often~~ a body possessing energy does not do any work at all, it only has the latent ability. So, energy of a body is nothing more than the ability to do work.① You can not do anything without it.

There are different forms of energy. They can all be changed from one form into another and used to do work in one way or another. When we use energy, we only change its form. It is never destroyed. The amount of energy remains constant at all times. Or to say, whenever a given amount of energy in one form is used, there is always an equal

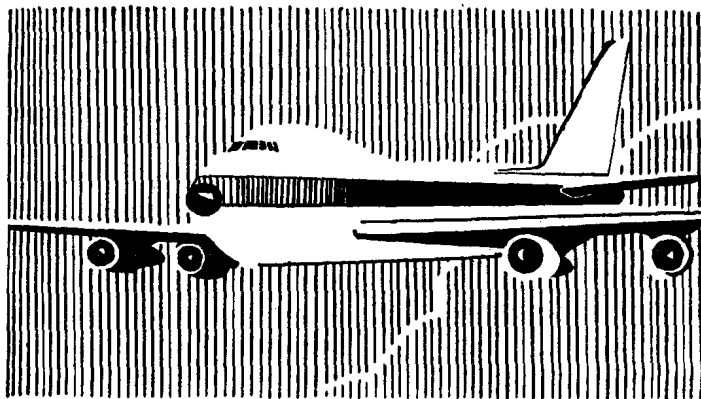


Fig. 1: Energy is invisible, but it sure gets things done.

amount of energy in some other form in its place.^② This important phenomenon is known as the law of conservation of energy. The discovery of this law has greatly pushed physics forward. "Natural science", as Chairman Mao taught us, "is one of man's weapons in his fight for freedom."

We have seen many cases of energy transformation. Here is an example. An airplane engine produces thrust when it transforms the chemical energy of the fuel into the kinetic energy of the combustion products. In this case, fuel combustion first transforms the chemical energy into heat. Then the moving combustion products go on transforming the heat energy into kinetic energy, producing thrust.^③ To conclude, we may say that energy exists only in a few forms, but examples of its transformation are too numerous to list.

New Words

latent ['leɪtənt] <i>a.</i> 潜在的	fight [faɪt] <i>v.; n.</i> 战斗, 争取
nothing ['nʌθɪŋ] <i>n.</i> 什么也没有	fought [fɔ:t], fought
destroy [dis'trɔɪ] <i>v.t.</i> 消灭	freedom ['fri:dəm] <i>n.</i> 自由
remain [ri'mein] <i>v.i.</i> 保持	case [keɪs] <i>n.</i> 事情, 情况; 例子
constant ['kɒnstənt] <i>a.</i> 不变的	transformation [trænsfə'meɪʃən] <i>n.</i> 转变, 改造
whenever [wen'evə] <i>conj.</i> 无论什么时候	airplane ['æəpleɪn] <i>n.</i> 飞机
equal ['i:kwəl] <i>a.</i> 相等的	engine ['endʒɪn] <i>n.</i> 发动机, 引擎
conservation [kɒnsə'veɪʃən] <i>n.</i> 保存; 守恒	thrust [θrʌst] <i>n.</i> 推力
discovery [dis'kʌvəri] <i>n.</i> 发现, 发见	fuel [fjuəl] <i>n.</i> 燃料
push [puʃ] <i>v.</i> 推进	kinetic [kaɪ'netɪk] <i>a.</i> 动力(学)的
natural ['nætʃrəl] <i>a.</i> 自然的, 生来的	combustion [kəm'bastʃən] <i>n.</i> 燃烧
	numerous ['nju:mərəs] <i>a.</i> 众多的, 许多的
	list [lɪst] <i>v.</i> 列举, 记入目录

conservation of energy

Phrases and Expressions

at all 全然, 究竟, 根本	in this case 在这种情况下
nothing more than... 不过是... 而已	to go on... 继续
at all times 随时	to conclude 总之(插)
to be known as... 称为	too...to... 太...而不能(做)

Notes

- ① ...is nothing more than the ability to do work.

句中动词不定式短语 to do work 作 the ability 的定语。
全句可译为:“因此,一种物体的能量不过是做功的能力而已。”

- ② Or to say, whenever a given amount of energy ...in its place.

or to say “或者说”,作插入语用。whenever 引出的为时间状语从句。in its place 可译为“代替”。

- ③ ...producing thrust

现在分词短语 producing thrust 在句中作状语,表示结果。

Translation

能

当一个物体做功时,我们说它具有能。一个具有能的物体通常并没有做功,只是它具有这种潜在的能力。因此,物体的能无非是做功的能力而已。没有能你就什么也干不了。

有各种不同形式的能。它们可以由一种形式变成另一种形式,并以某种方式用来做功。当我们使用能时,我们只是改变它的形式。能永远不会被消灭。能的量永远不变。换言之

之,每当一定量的一种能被用掉时,就有等量的某种其他形式的能来代替它。这一重要现象就称为能量守恒定律。这一定律的发现大大推动了物理学的发展。正如毛主席教导我们的:“自然科学是人们争取自由的一种武装”。

我们看到过许多能量转换的情况。这里就是一个例子。一架飞机的发动机当它把它的燃料的化学能变为燃烧产物的动能时就产生推力。在这种情况下,燃料的燃烧首先将能量由化学能变为热能,然后运动的燃烧产物继续将热能转化为动能,从而产生推力。总之,我们可以说能量存在的形式虽然不多,然而其转换的例子则是多得不胜枚举的。

2. ENERGY CONVERSION

energy conversion

The conversion of mechanical energy to heat is by no means new to us.^① We are also familiar with other transformations of energy. Chemical energy is converted into heat when fuel burns. Electrical energy is transformed into heat and light in electrical lamps and electrical stoves. Radiant energy turns into heat when sunlight strikes an object which absorbs it. “All contradictory things are interconnected; not only do they coexist in a single entity in given conditions, but in other given conditions, they also transform themselves into each other.”^② In a word, all energies may be converted from one form to another and what is more,^③ they all can transform into heat by themselves. Heat is an energy of irregular motion of particles in a substance, at

ordinary temperature it is less usable than any of the other energies.

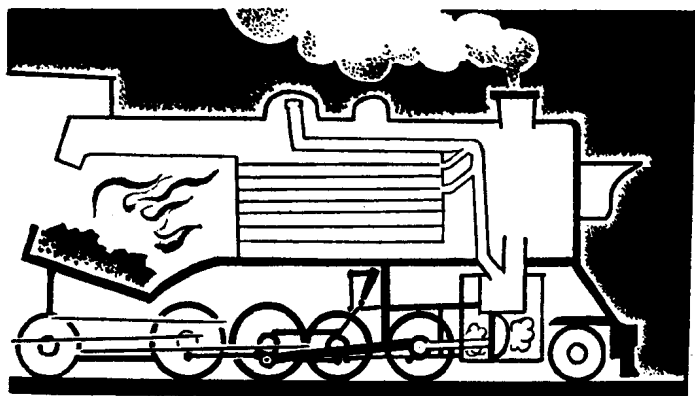


Fig. 2: Coal makes trains go, can you tell how many energy conversions are involved here?

However, at high temperatures heat energy may be converted into energy of more usable forms. Some people have made different kinds of machines to convert heat into mechanical energy.^④ Diesel and gasoline engines are designed to convert heat that is developed by the burning of fuel into mechanical energy for running tractors, trucks, and cars. The mechanical energy transformed from heat in a steam turbine is made to operate generators. And the generators, in turn, convert the mechanical energy into electrical energy. All these transformations are taking place every minute and everywhere in our daily life and production.

New Words

convert [kən'veɪt] v.t. 转变, 变换 lamp [læmp] n. 灯
transform [træns'fɔ:m] v.t. 转变 stove [stəʊv] n. 火炉

radiant ['reɪdʒənt] <i>a.</i> 辐射的	themselves [ðəm'selvz] <i>prep.</i> 他(她、它)们自己
sunlight ['sʌnlait] <i>n.</i> 日光, 阳光	irregular [i'regjulə] <i>a.</i> 不规则的, 无规则的
strike [straɪk] <i>v.t.</i> 打击, 碰撞	particle ['pɑ:tɪkl] <i>n.</i> 粒子, 微粒
struck, struck [strʌk]	substance ['sʌbstəns] <i>n.</i> 物质
absorb [əb'sɔ:b] <i>v.t.</i> 吸收, 吸引	ordinary ['ɔ:dinəri] <i>a.</i> 普通的, 一般的
contradictory [kəntrə'dɪktəri] <i>a.</i> 矛盾的, 相反的	usable ['ju:zəbl] <i>a.</i> 可用的, 合用的
interconnect [ˌɪntəkə'nekt] <i>v.</i> 互相联系	diesel (engine) ['di:zəl] <i>n.</i> 柴油发动机
coexist ['kəʊɪg'zɪst] <i>v.i.</i> 共处, 共存	gasoline (engine) ['gæsəli:n] <i>n.</i> 汽油(发动机)
entity ['entɪti] <i>n.</i> 实体, 总体, 统一体	

Phrases and Expressions

to be familiar with... 熟悉 in a word 总之

Notes

- ① ...is by no means new to us.
by no means 为一个成语, 意为“决不”、“一点也不”。全句可译为:
机械能转换为热能对我们一点也不生疏。
- ② Not only do they coexist..., but in other given conditions, they also transform themselves into each other.
1. 并列连词 not only ... but (also) 连接的为一个表示强调意义的并列句, 因此, 在 not only 后面, 主语 they 之前加一个表示强调的助动词 do。
2. 介词短语 in other given conditions 在该句中作条件状语, 说明谓语 transform。
3. themselves 为自身代词, 代替本句句首的 all contradictory things。
- ③ ... what is more 起插入语作用, 意为“而且”。

- ④ ... to convert heat into mechanical energy.

动词不定式短语 to convert heat ... 在句中作目的状语,说明谓语 have made。

Translation

能 量 转 换

机械能转换为热能对我们一点也不生疏。我们也熟悉其他的能量转换。燃料燃烧时,化学能就转换成热能。在电灯及电炉中,电能转换为光能和热能。太阳光照到吸收光的物体上时,辐射能就转换为热能。“一切矛盾着的東西,互相联系着,不但在一定的条件之下共处于一个统一体中,而且在一定条件之下互相转化”。总而言之,一切能都可以从一种形式转换成另一种形式,并且它们自己都能转换成热能。热能是物质微粒无规则运动的能量,在常温下它比其他各种能的利用率要低。

然而在高温下,热能可转换成更有用的能。人们已经制造出一些能够把热能转换为机械能的机器。柴油发动机和汽油发动机把燃烧燃料产生的热能转换成机械能,用来开动拖拉机、卡车和汽车。蒸汽涡轮机把热能转换为机械能,机械能使发电机运转,而发电机又把机械能转换为电能。这些能量转换在我们的日常生活和生产中时时处处都在发生着。

3. CONSERVATION OF ENERGY

In any energy transformation, there is some loss, but no energy is destroyed. The part that is lost is simply wasted. If all of the energies that are wasted were added to that used, the total would be found to be equal to the total supplied.^① The form may be changed, but the amount remains unchanged. The fact that energy can be changed from one form to another, but can neither be created nor destroyed, constitutes one of the most important laws in science, the law of conservation of energy.^② No one form of energy can be long conserved, but the total is conserved at any time. A machine may be designed to lift a much larger weight than the force that is applied, but it can never produce more work than was supplied to it.^③ In other words, a machine cannot

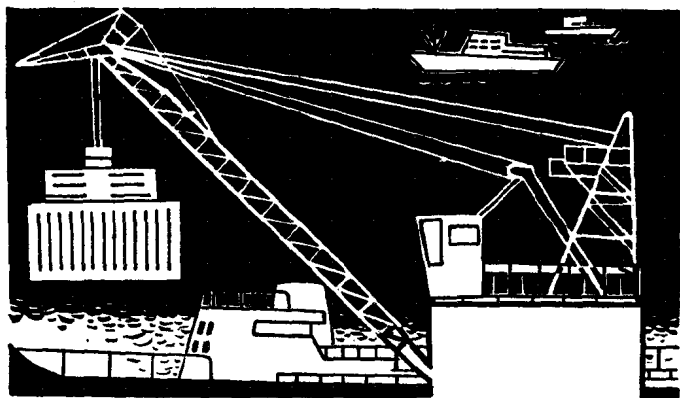


Fig. 3: The law of lever basing on the conservation of energy is being put into practice.