教育部大学英语教改示范点建设项目成果
大学专业基础英语系列教材

总主编◎蒙兴灿

Biology Basic English

生物基础英语

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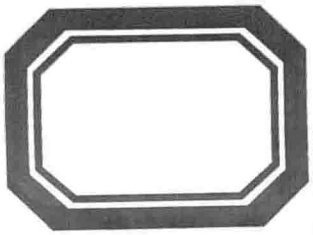

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前言 Preamble

《大学英语课程教学要求》指出“将综合英语类、语言技能类、语言应用类、语言文化类和专业英语类等必修课程和选修课程有机结合，以确保不同层次的学生在英语应用能力方面得到充分的训练和提高；既要保证学生在整个大学期间的英语语言水平稳步提高，又要有利于学生个性化的学习，以满足他们各自不同专业的发展要求”。为适应人才培养的需求，浙江理工大学依托教育部大学英语教学改革示范点建设项目，组织编写了本套大学专业英语系列教材。

本系列教材共6册，即《纺织基础英语》、《服装基础英语》、《机械基础英语》、《建工基础英语》、《商务基础英语》、《生物基础英语》。本系列教材在内容上突出基础性，强调专业性与应用性的有机结合，适合本科二、三、四年级非英语专业学生在完成基础英语学习之后，了解和掌握本专业的相关英语术语及知识。

本册教材《生物基础英语》共计8个单元，取材面广，大多数材料选自英美原版资料，内容涵盖生物学概要、生物学发展史上的重要人物和成就、微生物学、生物基因工程、生物多样性和外来生物入侵、生物伦理、生物营养与食品安全、生物制药等方面。我们在编写过程中，力求体现以下几个特点：

1. 注重基础性、通用性。本教材所选篇目强调科学性和知识性，同时保证材料难度适中，符合学生语言认知需求。所选的文章篇幅在每篇1000词左右，配套练习精心设计。通过对本教材的学习，学生不仅可以对生物专业知识有初步的认识和了解，同时能提高英语语言综合技能和跨文化交际能力。

2. 主题明确，内容丰富。每个单元紧扣同一主题展开，视听材料和阅读文章注重学生听、说、读、写、译等语言技能的综合培养。第一篇文章建议课上完成，后两篇可作为泛读材料使用，用于训练学生的综合阅读技能、拓宽视野、增长知识。

3. 注重启发性和培养学生科研能力的任务活动设计。教材中的视听练习设计强调教师和学生的教学互动；任务的设计具有明确目的和启发性，并要求学生课外延伸学习，以此培养学生的自主学习能力和语言交际能力。

本教材能够顺利出版，得益于浙江理工大学外国语学院和浙江大学出版社的大力支持、编写组全体成员的通力合作和辛勤劳动，在此深表谢意。由于编者水平有限，本教材的疏漏和不足之处，欢迎大家批评指正。

编　者

2012年6月

目 录 Contents

Unit 1

An Introduction to Biology

PART ONE

Warming-up Activities

◆ Fast Reading Practice

Directions: Read the passage and answer the following questions.

The Significance of Biology in Your Life

Eldon D. Enger and Frederick C. Ross

Many college students question the need for science courses such as biology in their curriculum, especially when their course of study is not science related. However, it is becoming increasingly important that all people be able to recognize the power and limitations of biology, understand how scientists think, and appreciate how the actions of societies change the world in which we and other organisms live. Consider how your future will be influenced by how the following questions are ultimately answered:

Does electromagnetic radiation from electric power lines, computer monitors, cell phones, or microwave ovens affect living things?

Is DNA testing reliable enough to be admitted as evidence in court cases?

Is there a pill that can be used to control a person's weight?

Can physicians and scientists manipulate our genes in order to control certain disease conditions we have inherited?

Will the thinning of the ozone layer of the upper atmosphere result in increased incidence of skin cancer?

Will a vaccine for AIDS be developed in the next 10 years?

Will new, inexpensive, socially acceptable methods of birth control be developed that can slow world population growth?

Are human activities really causing the world to get warmer?

How does extinction of a species change the ecological situation where it once lived?

All these problems are closely related to our daily life and gradually influence almost every aspect, so an understanding of the nature of biology is important for any person, regardless of his or her vocation.

Biology in Everyday Life

The news headlines in the picture reflect a few of the biologically based issues that face us every day. Although articles such as these seldom propose solutions, they do inform the general public so that people can begin to explore possibilities and make intelligent decisions leading to solutions.

Most of the important questions of today can be considered from philosophical, social, and scientific perspectives, but none of these approaches individually presents a solution to most problems. For example, it is a fact that the human population of the world is growing very rapidly. Philosophically, we may all agree that the rate of population growth should be slowed. Biology can provide information about the reproductive process and how it can be controlled, but society must answer the more fundamental social and philosophical questions about reproductive rights and the morality of controls. It is important to recognize that the science of biology has a role to play but that it does not have the answers to all our problems.

● Questions:

1) Why is biology important for non-science majors?

_____

2) How is our life related to biology?

_____

3) Can the science of biology provide answers to all our problems?

_____

◆ Video Watching and Viewing

1. Directions: Watch the video and answer the following questions.

1) What did Robert Brown and Theodor Schwann both discover?

_____

2) How did Robert Brown discover it?

_____

3) Where did Theodor Schwann find the similar structure?

_____

2. Directions: Watch the video again and discuss the following questions in pairs.

1) Say something about Robert Brown's discovery.

_____

2) What does Theodor Schwann describe in his book?

_____

3) Why is the discovery of cell nucleus a revolutionary breakthrough in the development of biology?

_____

PART TWO
READING ACTIVITIES

Passage 1 What Is Biology?

Batul Nafisa Baxamusa

I have forever been fascinated by the field of biology. Biology contains the essence of every other field of science like chemistry, biochemistry, even a bit of physics. But, what is biology is a question asked by many students. Biology is the study of life and all other aspects related to life. Anything or everything that is alive or dead is studied under biology. Let us go into the details of what is biology about.

What Is Biology?

As mentioned above biology is the study of interactions of life. Biology covers a number of subjects under the sun like plants, animals, marine animals and plants, microorganisms, genes, and many more. A biologist investigates the biological processes and phenomena that help build a correlation between all living things. There are certain characteristics of life that are considered under biology. Let us see some of the characteristics of life that will lead to an answer for what is biology about.

Characteristics of Life

The first characteristic of life is the cell. A cell is the basic unit of life, be it for animals, plants or single-celled organism[1]. All living organisms, single-celled and multi-cellular organisms are made up of cells. Cells make up tissues, that form organs and organs lead to organ system. An organ system is contained within the organism.

The next characteristic of life is energy transformation. All living things require energy to function. This energy is transferred from the environment to the organism in the form of food. Metabolic processes are therefore, very important for maintenance of life.

The third characteristic of life is reproduction. If an organism is alive, it will reproduce. Reproduction can be asexual or sexual. A few organisms undergo binary fission[2]. Only living organisms have the ability to reproduce. When there is reproduction then comes in the next characteristics of life, growth. Living organism need to grow in order to complete their life cycle. Single-celled organisms grow by increasing their cell volume. Multi-cellular organisms tend to add more cells to their body in order to grow.

As an organism grows, it begins to respond to the environment. This brings us to our next characteristics of living things that is sensation. Living organisms respond to external stimuli like heat, cold, pain, etc. A few reactions to the environment take place instantly and some take place

over time. This response can occur on cellular level called homeostasis. When set of complex reactions take place it is called behavior.

And lastly what is biology? It also includes the last characteristics of life, that is, adaptation. Organisms, mostly over thousands of years begin to adapt to their environment. This adaptation leads to permanent genetic changes in the organisms. This process of adaptation is vital for survival of species and is called evolution. If the organism fails to adapt, it will perish.

What is Biology About?

The answer to what is biology about is based on the basic principles of biology. These principles form the foundation of biology. Let us have a look at the 5 basic principles that will help you understand what biology is about.

Cell Theory. The cell theory proves and states that a cell is the fundamental unit of life. All living organisms are made of one or more cells. In some cases, organisms are made of the secreted products of cells like shells. All cells contain the hereditary information of life, that is, DNA and RNA.

Gene Theory. The gene theory states that genes are inherited by all organisms from their parents. All organisms from a tiny virus or bacteria to a multi-cellular organism like the elephant follow the same process of copying and translating DNA to proteins. The progeny will contain sets of similar genes transferred from the parent.

Evolution. The theory of evolution states that all organisms have descended from a common ancestral gene pool on earth. Over thousands of years genetic changes have led to formation of different species. Over thousands of generation, changes take place in organisms that may be small or large and in some cases, visible or inconspicuous.

Homeostasis. All living organisms are able to maintain homeostasis. This means regulation of their internal environment to maintain equilibrium with the environmental changes.

Thermodynamics. Energy is transferred from one form to another with the help of food and metabolic processes. Thus, energy transformation is not always efficient, but energy will forever remain constant.

Classifications of Biology

At the highest level, biology is broken down based on the type of organism being studied: zoology, the study of animals; botany, of plants; and microbiology, of microorganisms. Each field has contributed to mankind or the Earth's well-being in numerous ways. Most prominently: botany, to agriculture; zoology, to livestock and protection of ecologies; and microbiology, to the study of disease and ecosystems in general.

Besides classifications based on the category of organism being studied, biology contains many other specialized sub-disciplines, which may focus on just one category of organism or address organisms from different categories. This includes biochemistry, the interface between biology and chemistry; molecular biology, which looks at life on the molecular level; cellular

biology, which studies different types of cells and how they work; physiology, which looks at organisms at the level of tissue and organs; ecology, which studies the interactions between organisms themselves; ethology, which studies the behavior of animals, especially complex animals; and genetics, overlapping with molecular biology, which studies the code of life, DNA.

This was all about what is biology and the branches of biology. As you can see, it is the study of life and all the processes of life. You get to learn about genes, reproduction, evolution, adaptation and behavioral changes in an organism. This is the field that will help you answer many questions like What came first, the chicken or the egg, and even questions like Why do we yawn when sleepy. If you have the desire to answer the Who, What, Why, When and How about life, then the field of biology is the career path you should choose.

(1003 words)

Proper Names

DNA /ˌdiːˌenˈeɪ/ *abbr.* 脱氧核糖核酸(deoxyribonucleic acid)
RNA /ˌɑːˌenˈeɪ/ *abbr.* 核糖核酸(ribonucleic acid)

New Words

ancestral /ænˈsestrəl/ *adj.* 祖先的,祖宗传下来的;原型的,激发灵感的
asexual /eɪˈseksjʊəl/ *adj.* 无性生殖的;无性的,无性欲的
biochemistry /ˈbaɪəʊˈkemɪstrɪ/ *n.* 生物化学
botany /ˈbɒtənɪ/ *n.* 植物学;(某地区或某时期的)植物生态
cellular /ˈseljələ/ *adj.* 细胞的,细胞状的;多孔的;移动无线电话系统的
correlation /ˌkɔːrəˈleɪʃən/ *n.* 相互关系,关联;交互作用,对比
ecology /ɪˈkɒlədʒɪ/ *n.* 生态,生态平衡;生态学
ecosystem /ˈekəʊˌsɪstəm; ˈiːkəʊ-/ *n.* 生态系统,生物相互支持并平衡的系统
equilibrium /ˌiːkwəˈlɪbriːəm; ˌekwə-/ *n.* 平衡,均势;(心情、感情等)平静
ethology /ɪˈθɒlədʒɪ/ *n.* 动物行动学;个体生态学
genetics /dʒɪˈnetɪks/ *n.* 遗传学
hereditary /hɪˈredɪtərɪ/ *adj.* 遗传的,遗传性的;传统的,祖传的
homeostasis /hɪˈredɪtərɪ/
inconspicuous /ˌɪnkənˈspɪkjuːəs/ *adj.* 不显眼的,不引人注意的,(花)不显著的
interaction /ˌhəʊmɪəʊˈsteɪsɪs/ *n.* 内稳态,体内平衡
internal /ɪnˈtɜːnəl/ *adj.* 体内的;内部的,里面的;国内的,内政的
livestock /ˈlaɪvstɒk/ *n.* 家畜,牲畜
maintenance /ˈmeɪntənəns/ *n.* 维持,维护,保养;生计,生活费,生活资料
marine /məˈriːn/ *adj.* 海洋的;海产的;海运的,海事的;海军的;军舰的
n. (尤指美国或英国皇家)海军陆战队士兵
metabolic /ˌmetəˈbɒlɪk/ *adj.* 新陈代谢的
microbiology /ˌmaɪkrəʊbaɪˈɒlədʒɪ/ *n.* 微生物学

microorganism /ˌmaɪkrəʊˈɔːgəˌnɪzəm/ *n.* 微生物；微小动植物
molecular /məˈlekjələ/ *adj.* 分子的，由分子组成的
n. 分子性，分子状态
perish /ˈperɪʃ/ *vi.* 死亡，消亡；枯萎，凋谢；腐败，腐烂
physiology /ˌfɪziːˈɒlədʒɪ/ *n.* 生理学；生理机能
progeny /ˈprɒdʒənɪ/ *n.* （复数）后裔，后代；结果，成果
prominently /ˈprɒmɪnəntlɪ/ *adv.* 显著地，重要地
protein /ˈprəʊtiːn/ *n.* 蛋白质
reproduction /ˌriːprəˈdʌkʃən/ *n.* 繁殖，生殖；复制，再现；复制品
sensation /senˈseɪʃən/ *n.* 感觉，知觉；兴奋，感动；轰动，引起轰动的人（或物）
stimulus /ˈstɪmjʊləs/ *n.* （复数 stimuli /ˈstɪmjʊlaɪ/）刺激（物）；促进因素
sub-discipline /ˈsʌbˈdɪsɪplɪn/ *n.* （学科的）分支，分科
thermodynamics /ˌθɜːməʊdaɪˈnæmɪks/ *n.* 热力学
tissue /ˈtɪsjuː/ *n.* （人、动植物的）组织；薄纸，棉纸；一套，一系列
transformation /ˌtrænsfəˈmeɪʃən/ *n.* 改变，变化；转化，变形
zoology /zəʊˈɒlədʒɪ/ *n.* 动物学

Phrases and Expressions

adapt to	使适合，使适宜
contribute to	是……的部分原因；促成，有助于
descend from	由……传下来的；起源于
tend to	趋向，有……的倾向；走向，导致

Notes

1. Single-celled organism (also known as unicellular organism): an organism that consists of only one cell. 单细胞生物
2. Binary fission (also known as Prokaryotic fission): a form of asexual reproduction and cell division used by all prokaryotes and some organelles within eukaryotic organisms. 二分裂

Post-reading

● Reading Comprehension

Directions: Read the passage carefully and answer the following questions.

1) What is biology? And what do biologists investigate?

_____

2) What are the characteristics of biology?

_____

3) How does energy transfer from the environment to the organism?

_____

4) What are the 5 basic principles of biology?

_____

5) How is biology classified at the highest level?

_____

● Vocabulary

1. Directions: Complete the following sentences by using the appropriate form of the words given in the box.

ancestral	correlation	hereditary	inconspicuous	perish
investigate	maintenance	overlap	tissue	livestock

1) But there seems to be a _____ between stress and lack of holidays.

2) He who knows not the enemy and himself is bound to _____.

3) We should study our _____ achievements.

4) The official news agency said the incident was now _____ .

5) Pick up the pork, and put it on some _____ to remove the water and oil.

6) The wind was so violent that our _____ staff could not get out to fix the antennae until a few hours later.

7) At the moment, 70 percent of all our agricultural land is being used to produce _____.

8) He dragged her off to parties, and she spent the whole evening trying to look _____ in some corner.

9) We have to avoid _____ to cooperate with each other in our research development.

10) Revolution can only occur at a time when both _____ and external conditions of a country are ripe enough.

2. Directions: Choose the right word from the following groups of words to fill in each blank. Change the form if necessary.

1) adapt adaptable adaptive adaptation

A. A chameleon can make _____ coloring according to the environment.

B. Susan had thought she would _____ life there soon, but she found later things were not so easy.

C. He made a good _____ to his new school.

D. Perhaps John would have found Muller more likable if he had been less _____.

2) class classify classifiable classification

A. He took a first _____ honors degree and went to Cambridge to work for his doctorate.

B. The criteria for _____ of disabilities shall be established by the State Council.

C. Would you _____ her novels as serious literature or as mere entertainment?

D. All these materials are _____ to categories.

3) gene genetic genetics geneticist

A. The cause is not known, but it is thought to be the result of a combination of _____ and environmental factors.

B. Scientists are trying to find the _____ responsible for the disease.

C. And so, from that moment on, I wanted to be a _____ to understand the gene and through that, understand life.

D. _____ has opened the door to the study of human variability.

4) interact interactive interaction

A. Her lowered self-esteem affected the way she _____ with her children.

B. Emotion may seem out of place in a business setting, but in fact it plays a major role in every _____.

C. Poverty and disease have apparent _____ relationship: disease is the cause for and result of poverty.

5) sense sensible sensational sensation

A. It would be _____ for you to discuss this matter with you parents before making a decision.

B. Michael also _____ Hilary's frustration and encouraged her to be open about it.

C. Each year the city will hold a beauty contest, which never fails to be _____.

D. Li Taibo, who took first place in all of Beijing for the science portion of the exam, has become an instant _____.

6) transform transfer transformative transformation

A. All these chart the _____ of the Princess from a young, inexperienced teenager into a world-renowned style icon.

B. This atmosphere of excitement arising from imagination _____ knowledge.

C. And he gives play as a _____ force over his entire life.

D. The company _____ to an eastern location.

● Gap Filling

Directions: Complete the following passage with the most appropriate word or phrase in the box. Change the form if necessary.

acquired	by	continents	declined	penetrating
endless	little	later	produced	specialized
organic	through	stream	magic	transition

In what manner the sea 1) _____ the mysterious and wonderful stuff called protoplasm we cannot say. Before the first living cell was created, there may have been many trials and failures. It seems probable that, within the warm saltiness of the primeval sea, certain 2) _____ substances were fashioned from carbon dioxide, sulphur, nitrogen, phosphorous, potassium, and calcium. Perhaps there were 3) _____ steps from which the complex molecules of protoplasm

arose – molecules that somehow 4)_____ the ability to reproduce themselves and begin the endless stream of life.

Those first living things may have been simple microorganism rather like some of the bacteria we know today. At that time 5)_____ sunshine could enter their dim world, 6)_____ the cloud bank from which fell into the 7)_____ rains. Probably the sea's first children lived on the organic substances then present in the ocean waters, or lived directly on inorganic food.

All the while the cloud covering was thinning, the darkness of the nights alternated with palely-illumined days, and finally the sun for the first time shone 8)_____ upon the sea. By this time some of the living things that floated in the sea must have developed the 9)_____ of chlorophyll. Now they were able to take the carbon dioxide of the air and the water of the sea and of these elements, in sunlight, build the organic substances they needed. So the first true plants came into being.

Another group of organisms, lacking the chlorophyll but needing organic food, found they could make a way of life for themselves 10)_____ devouring the plants. As the years passed, and the centuries, and the millions of years, the 11)_____ of life grew more and more complex. From simple, one-celled creatures, others that were aggregations of 12)_____ cells arose, and then creatures with organs for feeding, digesting, breathing, reproducing.

During all this time the 13)_____ had no life. It was not until Silurian time, some 350 million year ago, that the first pioneer of land life crept out on the shore. It was an arthropod, one of the great tribe that 14)_____ produced crabs and lobsters and insects. On land and sea the steam of life poured on. New forms evolved, and some old ones 15)_____ and disappeared.