

专业英语

Subject-Based English

周美茹 高艳玲 主编 English for Environmental  
Science and Engineering

中国建材工业出版社

# 专 业 英 语

## Subject-Based English

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中国建材工业出版社

## 图书在版编目(CIP)数据

专业英语/周美茹,高艳玲主编. —北京:中国建材工业出版社,2003.8

ISBN 7-80159-496-7

I. 专… II. ①周… ②高… III. 英语—高等学校—教材 IV. H31

中国版本图书馆 CIP 数据核字(2003)第 066346 号

## 内 容 摘 要

本书针对高职高专学生的特点,内容由浅入深,教师可根据学生的英语基础进行选讲,共7个单元,38课。内容包括生态环境、能源、水污染、大气污染、固废污染、其他公害、绿色建筑和材料。

本书可作为高等职业学校、高等专科学校、成人高校及本科院校举办的二级职业技术学院和民办高校近环境类(生态保护、环境信息、环境管理、环境监理、环境工程等)和近建筑材料类(绿色建筑、绿色材料等)专业英语课程的教材,也可供大学本科和中专生作为科技英语阅读材料,专业人员亦可选用作为自修教材。

## 专 业 英 语

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出版发行:中国建材工业出版社

地 址:北京市海淀区三里河路11号

邮 编:100831

经 销:全国各地新华书店

印 刷:北京鑫正大印刷有限公司

开 本:787mm×1092mm 1/16

印 张:12.25

字 数:293千字

版 次:2003年8月第1版

印 次:2003年8月第1次

印 数:1~3000册

书 号:ISBN 7-80159-496-7/G·097

定 价:19.00元



本书如出现印装质量问题,由我社发行部负责调换。联系电话:(010) 68345931

# 前 言

本书力求体现高职高专培养应用型人才的特点，在编写过程中注重能力的培养，练习形式力求多样化。针对高职高专学生的英语基础，适当增加了英语词汇的练习和语言表达能力的练习，锻炼学生对英语科技材料的概括能力和对有关专业术语的描述能力。为适应不同英语基础学生的学习，课文内容由浅入深，使学生可以有选择地进行学习。

本书由河北建材职业技术学院周美茹副教授和中国环境管理干部学院高艳玲主编，编写分工为：周美茹编写第二单元、第四单元（第1~3课、第8课）、第六单元、第七单元。高艳玲编写第一单元（第1课）、第三单元（第1、2、5、6、8、9、10课）、第四单元（第3~7课）、第五单元。李志伟、徐春霞、崔力拓编写第三单元（第3、7课）。郭洪驹编写第三单元（第11课）。张仁志、陈翠芳编写第三单元（第4课）。侯铭海、李丽霞、胡桂萍编写第一单元（第2课）。

全书由中国环境管理干部学院耿世刚副教授、河北建材职业技术学院张淑婷副译审主审。河北建材职业技术学院刘晓勇就本书的编写系统和编写思想作了重要指导并提出了不少建设性的意见，燕山大学刘晓辉老师也给予了很大的帮助。在此谨向他们表示衷心的感谢。

限于编者水平，且编写时间仓促，书中缺点和错误难免，恳请读者指正。

编者

2003年7月

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## **Unit 1 Ecological Environment**

### **Passage 1 Introduction to Environmental Problems**

Environmental problems are always interrelated. Sometimes a solution to one problem actually creates another problem. For example, when people are sick and dying from disease, it is natural to want to improve human health. When health is improved and infant mortality is reduced, a population explosion may result. To feed this growing population, natural habitats are often destroyed by turning them into farmland. As natural habitats are destroyed, the wild plants, predatory animals, and parasites that once lived there are killed as well. Because of the lack of predators and parasites, outbreaks of insect pests become more common. Farmers use pesticides to control the pests and protect the crops, but in the process the environment becomes polluted. The development of this entire cycle in itself consumes fossil fuel supplies that are becoming scarce. In addition, when fuels are burned, air pollutants are generated.

#### **Overpopulation**

Overpopulation may be defined as the presence in a given area of more people than can be supported adequately by the resources available in that area. Many people argue that the population explosion that has taken place in the twentieth century is now the most important problem we face. It is important first because overpopulation is a major cause of all other environmental problems: Fewer people would use less oil, chop down fewer trees, and pour less sewage into rivers. Second, overpopulation and the starvation that accompanies it are generally higher on our list of priorities than other environmental concerns. It is hard to argue that an area should be set aside as parkland to preserve a vanishing forest or savanna when that land might be used to raise crops that would prevent fellow human beings from starving to death.

#### **Pollution**

Pollution is a reduction in the quality of the environment by the introduction of impurities. Smoke pollutes the air; sewage pollutes the waters; junk cars pollute the land. We know that such contamination exists; it can be seen, smelled, or even tasted. The effects of pollution on human welfare or on the economy, however, may be matters of considerable disagreement.

**Air pollution** Every day, the average person inhales about 20,000 liters of air. Every time we breathe, we risk inhaling dangerous chemicals that have found their way into the air. Air pollution includes all contaminants found in the atmosphere. These dangerous substances can be either in the form of gases or particles. Air pollution can be found both outdoors and indoors. Pollutants can be trapped inside buildings, causing indoor pollution that lasts for a long time. The sources of pollution are both natural and human-based. As one might expect, humans have been producing increasing amounts of pollution as time has progressed, and they now account for the majority of pollutants released into the air.

Air pollution has been a problem throughout history. Even in Ancient Rome people complained

about smoke put into the atmosphere. The effects of air pollution are diverse and numerous. Air pollution can have serious consequences for the health of human beings, and also severely affects natural ecosystems. Because it is located in the atmosphere, air pollution is able to travel easily. As a result, air pollution is a global problem and has been the subject of global cooperation and conflict.

**Water pollution** Attention for water pollution exploded in the 1980s. The oil spill of the Exxon Valdez showed many around the world just how horrible the effects of water pollution could be. However, even the Exxon Valdez spill barely touched the surface of the problem of water pollution. The ship spilt only 5% of the oil split that year, and oil is just one of many pollutants that people dump into the water every year. Every year, 14 billions pounds of sewage, sludge, and garbage are dumped into the world's oceans, 19 trillion gallons waste also enter the water annually.

The problem of ocean pollution affects every nation around the world. This is especially true because water is able to transport pollution from one location to another.

For many years, chemicals were dumped into bodies of water without concern, while many countries have now banned such behavior, it continues to go on today.

As the world has industrialized and its population has grown, the problem of water pollution has intensified. The simple fact that millions of people live along coastlines and near rivers means that these bodies of water are likely candidates for heavy and destructive pollution. It is hard to know now what our oceans will look like in the future. Just how damaged they will be by pollution is uncertain.

**Hazardous Waste:** Hazardous waste in addition to releasing gases and particles into the atmosphere, humans produce waste that is dumped on the environment. Often, this waste is hazardous and dangerous to both nature and human life. The levels of dangerous wastes continue to grow. Industries and individuals continue to be largely unaware of this major environmental problem. As a result, many people and industries are failing to prevent the creation of hazardous waste or to limit the negative effects it produces. Individuals often throw out goods without realizing that they are headed for a landfill and could be dangerous for the environment. No matter where people put these hazardous waste materials, there is always a chance that they could find their way into the ground, and eventually into our bodies. Corporations usually want to avoid the costs associated with having to limit creation of hazardous waste. Consequently, they build landfills on site and fill them with waste, or sometimes pay to have their waste removed. Often, hazardous materials are transported to areas that accept money to take the waste.

### **Changes in the global condition**

Scientists have begun only recently to wonder whether human activities might affect the global environment. Aerosol sprays and aircraft exhaust may be destroying the ozone layer in the atmosphere that filters out ultraviolet radiation. Burning fossil fuels releases carbon dioxide that could affect planetary weather patterns. Pollution of the oceans destroys plant life that produces oxygen, and such pollution might eventually reduce the oxygen content of the air we breathe. Throughout much of the world, forests, jungles, shrublands, and other natural systems are being converted to farm land. In many areas, this process is depleting the fertility of the soil, altering the climate, and causing the extinction of literally thousands of species of plants and animals. Except in emotional terms, people often do not know precisely what has been lost when a species becomes extinct. Scientists are convinced that many endangered



species of plants or animals should be saved because they may be essential in breeding valuable crops or domestic animals.

**Global warming** On June 23, 1998, James Hansen, the director of the Goddard Institute at NASA, told the Senate Committee on Energy and Natural Resources that global warming was a reality and that it was extremely dangerous. Global warming, also known as the greenhouse effect, immediately received international attention. Scientists, environmentalists, and governments around the world took an interest in the subject. Global warming is called the greenhouse effect because the gases that are gathering above the earth make the planet comparable to a greenhouse. By trapping heat near the surface of the earth, the greenhouse effect is warming the planet and threatening the environment. Many scientists criticized Mr. Hansen's report, and the debate over global warming continues today.

Current fears stem largely from the fact that global warming is occurring at such a rapid pace. Models are predicting that over the next century, the global temperature will rise by several degrees. Some scientists are as severe as some people say. They think that droughts, hurricanes, and floods often blamed on global warming might actually have other causes.

One major difficulty in studying global warming is the fact that weather data only exists for the last century and a half. As a result, understanding the present and predicting the future are very difficult.

**Ozone depletion** The ozone layer protects the Earth from the ultraviolet rays sent down by the sun. If the ozone layer is depleted by human action, the effects on planet could be catastrophic.

Ozone is present in the stratosphere reaches 30 miles above the Earth, and at the very top it contains ozone. The sun's rays are absorbed by the ozone in the stratosphere and thus do not reach the Earth. Ozone is a bluish gas that is formed by three atoms of oxygen. The form of oxygen that humans breathe in consists of two oxygen atoms,  $O_2$ . When found on the surface of the planet, ozone is considered a dangerous pollutant and is one substance responsible for producing the greenhouse effect. The highest regions of the stratosphere contain about 90% of all ozone. In recent years, the ozone layer has been the subject of much discussion. And rightly so, the ozone layer protects both plant and animal life on the planet. The fact that the ozone layer was being depleted was discovered in the mid-1980s. The main cause of this is the release of CFCs chlorofluorocarbons.

Antarctica was an early victim of ozone destruction. A massive hole in the layer right above Antarctica now threatens not only that continent, but also many others that could be the victims of the ozone layer can be conserved.

### **Depletion of resources**

A resource is any source of raw materials. Fuels, minerals, water, soil, and timber are all resources. A material is depleted, or used up, as it becomes less available for its intended function. Material resources can become depleted in three different ways. First, a substance can be destroyed, that is, converted into something else. Fuels are destroyed when they are used; coal is converted to ashes and gas; uranium is converted to radioactive waste products. The ashes or waste products are no longer fuels.

Second, a substance can be lost by being diluted, or by being displaced to some location from which it cannot easily be recovered. If you open a helium filled balloon, the gas escapes to the atmosphere. Not one atom of helium is destroyed, but nevertheless the gas is lost because it would be impossible, as a

practical matter, to recover it. The same concept of loss by dilution applies to minerals.

Third, a substance can be rendered unfit for use by being polluted. In this way pollution and depletion are related to each other. If industrial or agricultural wastes are discharged into a stream, or if they percolate 'down through soil and porous rock to reach a supply of groundwater, then these water resources become less fit for drinking, or in the case of the stream, for recreation or for the support of aquatic life.

Finally, conservation is often seen as a measure whose benefits will be realized later, perhaps only by our children or grandchildren, and not all makers of policy are equally concerned about future generations.

## War

In many ways, war is a combination of all environmental problems rather than a separated category. From time immemorial, overpopulation have led human groups into wars over food, land, or some other coveted resource. In modern times war and the preparation for war have led to pollution and depletion of resources that are far more extreme than any single peacetime activity. War reduces population, although the effect is trivial more people were born in 6 months in 1982 than were killed throughout the first and second world wars. Finally, a nuclear war places the global systems of the Earth, human civilization, and even the human species itself at risk.

## Words and Expressions

interrelated	[ˈɪntəriˈleɪtɪd] adj. 相关的
mortality	[məʊˈtælɪti] n. 死亡率
habitat	[ˈhæbɪtæt] n. (动植物的) 生活环境, 产地、栖息地,
parasite	[ˈpærəsait] n. 寄生虫, 食客
interlocking	[ˌɪntə(ː)ˈlɒkɪŋ] adj. 连锁的
manageable	[ˈmænɪdʒəbl] adj. 易处理的, 易管理的, 便于管理的
disruption	[dɪsˈrʌpʃən] n. 分裂, 瓦解, 破坏
overpopulation	[əʊvəpɒpjʊˈleɪʃ(ə)n] n. 人口过剩
organism	[ˈɔːɡənɪzəm] n. 生物体, 有机体
accumulate	[əˈkjuːmjuleɪt] v. 积聚, 堆积
decomposition	[ˌdiːkɒmpəˈzɪʃən] n. 分解, 腐烂
synthetic	[sɪnˈθetɪk] adj. 合成的, 人造的, 综合的
insecticide	[ɪnˈsektisaɪd] n. 杀虫剂
depletion	[dɪˈpliːʃən] n. 损耗
dilution	[daɪˈluːʃən, dɪˈl-] n. 稀释, 稀释法, 冲淡物
aquatic	[əˈkwætɪk] adj. 水的, 水上的, 水生的, 水栖的
explosion	[ɪksˈpləʊʒən] n. 爆发, 发出, 爆炸, [矿] 煤气爆炸
endangered species	濒于灭绝的物种
impurity	[ɪmˈpjʊərɪti] n. 杂质, 混合物, 不洁, 不纯
staggering	[ˈstæɡərɪŋ] adj. 蹒跚的, 摇晃的, 令人惊愕的

globalization	[ˈɡləʊbəlaɪˈzeɪʃən] n. 全球化, 全球性
deposition	[ˌdepəˈziʃən, diː-] n. 沉积作用, 沉积物
destructive	[disˈtrʌktɪv] adj. 破坏(性)的
inhale	[ɪnˈheɪl] vt. 吸入; vi. 吸气
contaminant	[kənˈtæmɪnənt] n. 致污物, 污染物
trapped	[træpt] adj. 捕集的, 捕获的, 收集的, 截留的
ecosystem	[iːkəˈsɪstəm] n. 生态系统
cooperation	[kəʊˌɒpəˈreɪʃən] n. 合作, 协作
conflict	[ˈkɒnflɪkt] n. 斗争, 冲突; vi. 抵触, 冲突
debate	[diˈbeɪt] v. 争论, 辩论; n. 争论, 辩论
hazardous	[ˈhæzədəs] adj. 危险的, 冒险的, 碰运气的
negative	[ˈnegətɪv] n. 否定, 片; adj. 否定的
landfill	[ˈlændfɪl] n. 垃圾掩埋法, 垃圾
consumption	[kənˈsʌmpʃən] n. 消费, 消费量
depletion	[diˈpliːʃən] n. 损耗
deplete	[diˈplit] vt. 耗尽, 使衰竭
catastrophic	[ˌkætəˈstrɒfɪk] adj. 悲惨的, 灾难的
candidate	[ˈkændɪdɪt] n. 候选人, 投考者

## Exercises

### I. Answer the following questions.

1. What are the largest problems now affecting the world environment?
2. Why is global warming called the greeninghouse?
3. What is the reason that causes the ozone depleted?
4. Why is overpopulation the most important problem we face?
5. How many ways material resources become depleted in?

### II. Discuss the following topic and make a report on it. Refer to the text if necessary.

What you have learnt about the environment after reading the text.

### III. Fill in the blanks with words listed below.

inhale atmosphere particle indoor last natural release

Every day, the average person \_\_\_\_\_ about 20,000 liters of air. Every time we breathe, we risk inhaling dangerous chemicals that have found their way into the air. Air pollution includes all contaminants found in the \_\_\_\_\_. These dangerous substances can be either in the form of gases or \_\_\_\_\_. Air pollution can found both outdoors and \_\_\_\_\_. Pollutants can be trapped inside buildings, causing indoor pollution that \_\_\_\_\_ for a long time. The sources of pollution are both \_\_\_\_\_ and human based. As one might expect, humans have been producing increasing amounts of pollution as time has progressed, and they now account for the majority of pollutants released into the air.

#### **IV . Put the following sentences into Chinese and talk about “what’s Eco-job”?**

Eco-job means a job where natural and human resources are used in a sustainable way, ecologically and socially. It means benefiting from the resources without destroying them on the long term.

To be able to do that we need to look at the world around us in a new way, to see that it is a system where everything is interlinked and in which we take part. We have to take responsibility for how we influence that system, looking beyond our own immediate profit. An economic system which ignores the ecological system and considers nature as an inexhaustible source of free resources, moreover garbage dump, is unsustainable and we are now beginning to suffer from a misused environment in the form of less and less pure air and pure water, of soils that are no longer fertile, of ozone holes, of illnesses such as cancer etc. . Together with us, thousands of species of plants and animals are also suffering, some to the extent that they have gone extinct.

To be trained for an eco-job means therefore both to learn the techniques of how to use the resources that the ecological system provides in a sustainable way and to change our sense of values so that growth, quantities and greed give way to conservation, quality and sharing. Eco-jobs could, and should eventually, be created in all sectors of society.

Ecological and Social Sustainability to use natural and human resources in an ecologically and socially sustainable way implies (10 important points):

- Using natural resources without destroying their quality.
- Using economically all non-renewable natural resources and seeking to substitute them with renewable ones.
- Using water and energy rationally and economically.
- Substituting toxic and cancer provoking synthetic chemical substances with natural substances that have less impact on life and the environment.
- Minimizing the production of garbage and wastes. Seeking to reuse and recycle them. Defining appropriate locations for the storage of industrial waste and handling it correctly.
- Reducing and possibly eliminating unsafe installations, procedures and materials that are dangerous for workers.
- Using protective devices for all workers who yet operate risky machinery and equipment. Using individual protective devices for those who work with toxic, radioactive or otherwise risky materials.
- Maintaining respectful work relationships and providing adequate working conditions.
- Giving the public truthful and clear information in adequate time of any situation arising which could threaten humans or the environment.
- Preserving the diversity of life. Saving species threatened with extinction.

Of course it is not obvious how to do all this in practice (especially not the last one), but we must start working on it and that is what many people are doing all around the world. Having this in mind whenever you relate to materials, sites or other living beings, is already a good start!

#### **V . Fill in the following blanks with the information from the reading passage.**

- 1.Environmental problems are always \_\_\_\_\_. Sometimes a solution to one problem actually creates another problem.

2. \_\_\_\_\_ may be defined as the presence in a given area of more people than can be supported adequately by the resources available in that area.
3. The effects of pollution on human welfare or on the \_\_\_\_\_, however, may be matters of considerable disagreement.
4. In modern times, the natural \_\_\_\_\_ of organic wastes does not always operate efficiently.
5. Burning fossil fuels releases \_\_\_\_\_ that could affect planetary weather patterns.

#### **IV . Talk with your partner about for Environmental Problems .**

#### **V . Reading training .**

When the sun returns after the long, dark winter and the snow starts to melt in the Arctic, the local environment changes dramatically. Gradually, the white, reflective snow disappears, revealing dark soil that absorbs the sun's energy. Soon, plants unfold their green leaves to start the new growing season, trying to make the most of the brief Arctic summer.

If the average air temperature during this time of year were consistently a few degrees warmer or a few degrees colder, the consequences could be profound for both plants and animals living along the edge of the receding snow cover. But that would not be the end of the story. Arctic snow is important for the energy balance of the whole globe. An earlier snowmelt might allow Earth to absorb more energy from the sun, affecting far more than a thin band in the far north.

This example illustrates how the Arctic plays a key role in one of the major environmental issues of today: global climate change.

## **Passage 2   Natural Disaster and Global Ecological Environment**

There are so many natural disasters in the world. In the past hundred years a million people have died in earthquakes, another million have been killed by hurricanes and tornadoes and 9 million have lost their lives in floods. In addition to this many million more have died as a result of famine and disease. We should also not forget in many of the world's countries drought, chronic water shortage, is a fact of life, especially in the African Sahara region bordering the Sahara desert.

Some disasters are really natural phenomenon. But the most important thing is that we need to consider the natural disaster that we are causing ourselves. Through our mismanagement of planet's resources we have catapulted hundreds of species of plants and animals into extinction, at the same time possibly wrecking our own long term prospects for survival. Maybe this is one disaster that could be averted if we are willing to act with a sense of responsibility.

Here are some examples about the destruction of global ecological environment.

(1) A third of the natural world has been destroyed by human activity in the last 25 years, and the rate of loss is accelerating.

(2) Of all the species that have ever lived on the planet 98% have died out, some quite naturally, others because of human activity, leaving only 2% of all species ever to have existed on the earth today. Sixty percent of the world's fish resources are either fully exploited or are in decline.

(3) Global deforestation is mainly caused by wood consumption for fuel and building and, in some countries clearance for agriculture, often by burning, is the main cause. The world's forest cover has decreased by 13% between 1960 and 1990 from 37 million km<sup>2</sup> to 32 million km<sup>2</sup>. The decreased cover of each year is equivalent to the loss of an area half the size of Norway.

(4) Natural temperate and tropical forests have many tree and plant species that coexist in complex ecosystems. But nowadays, a lot of reforestation, often for commercial crops, is with single species, leading to a decline in biodiversity.

(5) The emission of carbon dioxide from fossil fuel combustion in power generation, industry and transport causes global warming.

(6) Tourism is a greater threat to ecosystems than hurricanes. Uncontrolled sewage disposal from beachfront hotels causes severe problems, killing valuable inshore fish stocks.

(7) Over half the human population lives within 100km of the coast. High population density is responsible for much of the destruction of coastal habitats, which is a global problem. It is estimated that building and drainage have destroyed half of the world's salt marshes and mangrove swamps. Pollution and direct destruction have destroyed nearly ten percent of the world's coral reefs. A significant proportion of the pollutants entering the marine environment comes from air emissions, a large portion of which settle into coastal waters.

(8) The effect of consumption on the environment is three times greater in Europe than in Africa.

As we have entered the 21st century, witnessing devastating natural disasters like earthquakes,

hurricanes, typhoons, and regional wars creating massive refugee crises, the problem of how to cope is becoming a subject practical and academic study worldwide.

It now appears obvious that the string of natural weather disasters seen in the 90s is a direct result of global climate change, and stories about the massive relief efforts in the midst of these disasters dominate our news.

Ian Davies is a professor of disaster management at Cranfield University, near London. Davies has worked in the field since the early 1970s, and in that time has noted the development of a new generation of "disaster studies" courses offered as higher education. The United States is one country witnessing the growth of high level study into dealing with natural disasters. Relief efforts throughout the last decade have cost an average of US \$ billion per week.

Leading universities such as New York's Columbia, the University of California Los Angeles (UCLA) and Johns Hopkins in Baltimore all offer courses in disaster preparedness, response, mitigation and recovery.

Specifically, these disaster courses will marry the practical and theoretical elements involved, such as program planning, ecological change, evaluation of disaster preparedness programs and reviews of warning and monitoring systems. These courses could make a difference because they give a good balance and allow people working in the field to take a wider perspective. The students tend to be more mature, which suits aid agencies very well as they tend to prefer experienced people.

Teachers come from a variety of backgrounds academics from the social sciences, engineers, geologists and people who have worked in the Third World and with emergency management.

As universities and aid agencies begin to examine the fruits of the teaching, Ian Davies says: "There is no specific evaluation but you do hear less about poor management and more about positive responsibility compared to 10 years ago."

This interest in disaster studies has created a deeper examination of where responsibility for handling crises lies. Universities should play three principal roles in disaster and refugee studies research, teaching and the distribution of expertise to organizations. It is natural that universities take ownership of research and teaching as most aid agencies seldom have the capacity or time to evaluate disaster management. Development programs should stabilize countries, improve the welfare of their citizens and make them more crisis resistant.

### Words and Expressions

famine	[ˈfæmɪn] n. 饥荒, <古> 饥饿, 严重的缺乏
phenomenon	[fɪˈnɒmɪnən] n. 现象
exploit	[ɪksˈplɔɪt] vt. 开拓, 开发, 开采, 剥削, 用以自肥
mitigation	[ˌmɪtɪˈɡeɪʃən] n. 缓解, 减轻, 平静
geologist	[dʒiˈɒlədʒɪst] n. 地质学者
hurricane	[ˈhʌrɪkən, -kɪn] n. 飓风, 狂风
marsh	[mɑːʃ] n. 湿地, 沼泽, 沼泽地
swamp	[swɒmp] n. 沼泽, 湿地, 煤层聚水; v. 陷入沼泽, 淹没, 覆没

biodiversity	[ˌbaɪəʊˌdaɪˈvɜːsɪti] n. 生物多样性
mangrove	[ˈmæŋɡrəʊv] 红树属树木
coral reef	珊瑚礁

## Exercises

### I . Answer the following questions .

1. What are the natural disasters in the world?
2. What causes the natural disasters happen?

### II . Guess the meaning of the following words in italics using reading techniques .

1. Nuclear power stations are still a very small source of *radioactive* materials.

**radioactive** \_\_\_\_\_

2. Though much progress has been made in *modifying* the weather on a very small scale, the attempts to control weather over large areas of the world are still not successful.

**modifying** \_\_\_\_\_

3. Though the adoption of the *automatic assembly line* has made it possible to produce radio *components* in large quantities, the problem of improving their quality still remains unsolved.

**automatic assembly line** \_\_\_\_\_

**components** \_\_\_\_\_

4. A *hurricane*, or *typhoon* as it is called in some parts of the world, is the most destructive storm known.

**hurricane** \_\_\_\_\_

**typhoon** \_\_\_\_\_

5. Our solar system is only a very small part of the *galaxy* called the Milky May.

**galaxy** \_\_\_\_\_

### III . Translate the following passage into Chinese .

Introduction of Synthetic Chemicals into the Environment. Everything is made of chemicals people, eagles, trees, lakes, plastic everything. Although many natural chemical compounds have existed for billions of years, people have recently learned to make new chemical compounds, called synthetic chemicals. The quantity and variety of new synthetic chemicals are staggering. They are present in paints, dyes, food additives, drugs, pesticides, fertilizers, fire retardants, building materials, clothes, cleaning supplies, cosmetics, plastics, and so on.

Synthetic chemicals are noted for the variety of their properties. Some of them are drugs that save millions of lives every year, and others are poisons. But because most of them are new to the environment, the traditional patterns of decay and recycling do not necessarily apply. Some synthetic chemicals break down rapidly in the environment by the action of sunlight, air, water, or soil, and some are eaten by living organisms. Such processes may take place over a span of minutes, hours, or days. A material that decomposes in the environment as a result of biological action is said to be biodegradable.



## Unit 2 Energy

### Passage 1 Introduction to Energy

#### Historical perspective

For the first 99.65% of the time that man has occupied the earth, he relied almost entirely upon his own muscles to perform whatever tasks were necessary or desirable. It was not until he succeeded in domesticating the beasts of burden that he was able to rid himself of some of the numbing drudgery that seemed to be his lot. Domestication of animals was soon followed by the use of the wind to propel primitive vessels and flowing water to irrigate crops by means of crude water wheel that lifted the water from the canal or stream to the level of the field.

The next step was the utilization of wind and water power to grind grain and operate primitive machinery to perform a variety of tasks such as polishing, sawing, and turning. Water power soon was being used to operate a diversity of machinery to produce many products in demand by developing civilizations. This is the way it remained until the eighteenth century when Thomas Newcomen and James Watt developed the first practical devices that enabled man to free himself from dependence upon muscles, wind, and water to make his life a bit easier.

The Industrial Revolution in England and central Europe in the 1800's was powered by steam. While water powered industries clustered around advantageous areas along rivers, steam powered factories concentrated in regions close to fuel sources, mainly the coal fields of Europe and eastern United States. Thousands of people moved from rural areas to the industrial cities to work in the factories and created the problems unique to urbanization which are still with us.

With the invention of the electromagnetic generator in the latter part of the nineteenth century, it became possible to convert the energy of burning fuel to electricity which could then be transmitted to distant points for use. The first practical electric street railway (streetcar) went into operation in Germany, and Thomas Edison installed the first electric utility to supply 85 customers in New York City with incandescent electric lighting. Within a very short time, electric power was being generated and distributed at many places around the world and energy for everyone became a reality.

#### Energy—What it is

Energy is one of those fundamental terms in science that are impossible to define in the usual manner. If we resort to the dictionary definition, "energy is the ability to do work", then we are confronted with the necessity for defining the word work. The physicist regards work as a force acting through a distance, which is quite understandable except for the fact the term force also defies ordinary definition. If we say that force is a "push or a pull", we are now required to explain what we mean when we use these two words and about all we can say is that we exert energy when something is pushed or pulled. Energy is the