Unit 1 Environment
环境

Text A

Earth's Health in Sharp Decline, Massive Study Finds
大规模研究发现：地球的“健康”每况愈下

The report card has arrived from the largest ever scientific Earth analysis, and many of the planet's **ecosystems** are simply not making the grade.[1]

The UN-backed *Millennium Ecosystem Assessment Synthesis Report*[2] found that nearly two-thirds of Earth's life-supporting ecosystems, including clean water, pure air, and stable climate, are being **degraded** by **unsustainable** use.

Humans have caused much of this damage during the past half century. Soaring demand for food, fresh water, **timber**, **fiber**, and fuel have led to dramatic environmental changes, from **deforestation** to chemical pollution, the report says. The already **grim** situation may worsen dramatically during the first half of the 21st century, the report's authors warn.

Over 1,300 governmental and private-sector contributors from 95 countries **collaborated** to create the **landmark** study. For four years they examined the planet's many **habitats** and **species** and the systems that bind them together. The United Nations Environment Programme[3] compiled the report and released the results yesterday in Beijing, China.

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1. 有史以来对地球进行的最大规模的科学分析表明，地球上的许多生态系统都达不到标准。report card 原意为“学生成绩报告单”，在句中用作比喻，意思是“科学分析的结果”。make the grade 意为“达到要求的或预期的标准；成功”。not making the grade 与 report card 呼应，含义是“成绩不佳”。
2. *Millennium Ecosystem Assessment Synthesis Report*:《千年生态系统评估综合报告》。该报告对全球生态系统进行了迄今为止最为全面的分析和评价，全世界 95 个国家的 1，300 名科学家参加了这项研究。
3. the United Nations Environment Programme: 联合国环境规划署

"Only by understanding the environment and how it works, can we make the necessary decisions to protect it," UN Secretary General Kofi Annan[4] said in a press statement accompanying the report's release. "Only by valuing all our precious natural and human resources, can we hope to build a **sustainable** future."

Socioeconomic Impact

The report paints a rather **bleak** picture for biodiversity[5] throughout much of the natural world. Perhaps 10 to 30 percent of Earth's **mammal**, bird, and **amphibian** species are facing **extinction**.

The massive ecological survey was begun in response to Annan's Millennium Development Goals[6], a UN **initiative** that aims to dramatically reduce socioeconomic problems, such as hunger and extreme poverty, by 2015.

"The Millennium Ecosystem Assessment gives us, in some ways for the first time, an insight into the economic importance of ecosystem services and some new and additional arguments for respecting and **conserving** the Earth's life-support systems," said Klaus Toepfer, executive director of the **Nairobi**-based UN Environment Programme.

Current human usage patterns of Earth's environment have increased the global food supply, **albeit** too slowly to accomplish the UN goal of **halving** world hunger by 2015.

The negative effects of ecosystem **strain** also include collapsing **fisheries**, coastal "dead zones"[7] near **sediment**-heavy river mouths, shifting water quality, and unpredictable regional climate, the report says.

Deforestation and other radical ecosystem alterations also promote diseases, such as **malaria** and **cholera**, as well as new **strains** of existing **contagions**.

Changes to water systems may increase the frequency and severity of destructive floods. Over a hundred thousand people were killed in the 1990s by floods, which also caused destruction **to the tune of** 243 billion dollars (U.S.), according to the report.

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4. Kofi Annan: 科菲·安南（联合国第七任秘书长）
5. biodiversity: 生物多样性。指一个区域内生命形态的丰富程度，包括遗传（基因）多样性、物种多样性和生态系统多样性三个层次。
6. Millennium Development Goals: 千年发展目标
7. coastal "dead zones": 近海〝死亡区〞（指由于污染造成海洋生物大量死亡的近海水域）

The regions facing the greatest environmental **degradation** are also among the world's poorest: sub-Saharan Africa[8], Central Asia, and parts of Latin America, and South and Southeast Asia.

Call for Radical Change

The report urges drastic policy changes to the ways in which natural resources are used.

From an economic **perspective**, the study suggests that many **intact** ecosystems should be regarded as more valuable than those altered for commercial use.

For example, citing wetland wildlife habitat, water pollution **filtration**, water storage, and **recreational** value, the report **appraised** intact **Thai mangroves** at a thousand U.S. dollars per **acre** (0.4 **hectare**). The same mangroves were valued at only U.S. $200 an acre after they had been cleared for fish and **shellfish** farming.

"The overriding conclusion of this assessment is that it lies within the power of human societies to ease the strains we are putting on the nature services of the planet, while continuing to use them to bring better living standards to all," the report's 45-person board of directors[9] said in a statement.

"Achieving this, however, will require radical changes in the way nature is treated at every level of decision-making and new ways of cooperation between government, business and civil society," the statement continued. "The warning signs are there for all of us to see. The future now lies in our hands."

The board of the *Millennium Ecosystem Assessment Synthesis Report* was co-chaired by Robert Watson, chief scientist of the World Bank[10], and A. Hamid Zakri, director of the United Nations University Institute of Advanced Studies[11].

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8. sub-Saharan Africa: 指撒哈拉沙漠以南之中部非洲地区。
9. board of directors: 原意为"（公司）董事会"，此处指主持这项研究的委员会。
10. the World Bank: 世界银行。成立于 1945 年 12 月，是联合国下属的国际金融机构。
11. the United Nations University Institute of Advanced Studies: （UNU-IAS）联合国大学高等研究所（位于日本横滨）。联合国大学是一个国际学术团体，被视作联合国的智囊团，总部在日本东京。

Words & Expressions

acre	*n.*	英亩（1 英亩 = 40.47 公亩或 6.07 亩）
albeit	*conj.*	尽管，虽然
amphibian	*n.*	两栖动物（或植物）
appraise	*n.*	估价；评价；鉴定
bleak	*adj.*	暗淡的，凄凉的
cholera	*n.*	霍乱
collaborate	*v.*	（尤指在文艺、科学等方面）协作，合作
conserve	*v.*	保护；保存，保藏
contagion	*n.*	传染病
deforestation	*n.*	滥伐森林
degradation	*n.*	退化；衰变
degrade	*v.*	使恶化
ecosystem	*n.*	生态系统
extinction	*n.*	灭绝
fiber	*n.*	纤维（物质）
filtration	*n.*	过滤
fishery	*n.*	渔业，水产业
grim	*adj.*	严酷的
habitat	*n.*	（动植物的）生境，栖息地
halve	*v.*	减半
hectare	*n.*	公顷（= 100 公亩或 2.471 英亩）
initiative	*n.*	为解决困难而采取的行动
intact	*adj.*	未受损的；完整的
landmark	*n.*	〈喻〉里程碑（指具有划时代意义或起转折作用的重大事件）
malaria	*n.*	疟疾
mammal	*n.*	哺乳动物
mangrove	*n.*	红树属植物；美洲红树
Nairobi		内罗毕（肯尼亚首都）
perspective	*n.*	（观察问题的）视角；视点；想法
recreational	*adj.*	消遣的，娱乐的

sediment	*n.*	沉积（物），沉淀
shellfish	*n.*	水生贝壳类动物
socioeconomic	*adj.*	社会经济（学）的
species	*n.*	【生物】种，物种
strain	*n.*	①过度的使用；过劳 ②种；（动植物的）系，类系
sustainable	*adj.*	可持续的
Thai	*adj.*	泰国的
timber	*n.*	木材；原木
to the tune of		共计……
unsustainable	*adj.*	不可持续的

Exercises

I. Answer the following questions on the text.

1. What does the author mean by "many of the planet's ecosystems are simply not making the grade"?
2. Why was the UN Millennium Ecosystem Assessment initiated?
3. What is the overall attitude of the report concerning the future of the Earth?
4. What functions do wetlands play in conserving the environment?
5. What essential steps should be taken to change the degrading trend of the ecosystem?

II. There are two or three choices in the brackets of each of the following sentences. Choose the correct one according to the text.

1. A massive study finds that the Earth's health is in (gradual / sharp / hopeless) decline.
2. (Unsustainable / Unlimited / Inexhaustible) use of the natural resources is leaving many precious species on this planet on the verge of extinction.
3. Over the years, human beings' demand for food, fresh water, timber, fiber and fuel has been (dropping / faltering / soaring).
4. The environment of this planet is already in a (grim / pleasing / moderate) situation.

5. The research findings (indicated / released / demonstrated) yesterday will help us better understand the ecosystems and how they function.
6. The Assessment report paints a rather (promising / bleak / blank) picture for biodiversity throughout much of the natural world.
7. Millennium Development Goals is a UN (project / timetable / initiative) that aims to reduce socioeconomic problems by 2015.
8. The Assessment report offers us some new (insights / perceptions / proposals) into the economic importance of ecosystem services.
9. Collapsing fisheries, coastal "dead zones" near sediment-heavy river mouths, shifting water quality, and unpredictable regional climate are all (convincing / negative / supportive) effects of ecosystem strain.
10. Deforestation and other radical ecosystem (improvements / alterations) also promote diseases as well as new strains of existing contagions.

III. Choose the word or phrase which is closest in meaning to the underlined part in each sentence.

1. The largest ever scientific Earth analysis reveals that many of the planet's ecosystems are simply not <u>making the grade</u>.
   A. doing well enough B. progressing
   C. functioning D. moving in the right direction
2. Nearly two-thirds of Earth's life-supporting ecosystems, including clean water, pure air, and stable climate, are being <u>degraded</u> by unsustainable use.
   A. prevented B. marked C. determined D. made worse
3. They examined the planet's many <u>habitats</u> and species and the systems that bind them together.
   A. regions B. dwelling places
   C. shelters D. refuges
4. Only by valuing all our precious natural and human resources, can we hope to build a <u>sustainable</u> future.
   A. prosperous B. diverse C. livable D. lasting
5. Perhaps 10 to 30 percent of Earth's mammal, bird, and amphibian species are facing <u>extinction</u>.
   A. threat B. emergence C. urgency D. dying out

6. The Millennium Ecosystem Assessment gives us, in some ways for the first time, an insight into the economic importance of ecosystem services and some new and additional arguments for respecting and conserving the Earth's life-support systems.
   A. promoting B. emphasising C. protecting D. imposing
7. Deforestation and other radical ecosystem alterations also promote diseases, such as malaria and cholera, as well as new strains of existing contagions.
   A. species B. transmittable diseases
   C. destructions D. degradation
8. Changes to water systems may increase the frequency and severity of destructive floods.
   A. extensiveness B. expansion C. expenditure D. seriousness
9. Many intact ecosystems should be regarded as more valuable than those altered for commercial use.
   A. previous B. prior C. untapped D. former
10. Citing wetland wildlife habitat, water pollution filtration, water storage, and recreational value, the report appraised intact Thai mangroves at a thousand U.S. dollars per acre (0.4 hectare).
    A. estimation B. removal C. extinction D. inspection

IV. Use the terms in the text to replace the underlined parts of the following sentences.

1. Over a hundred types of insect are found in this area.
2. The dry summer has further increased the pressure on water resources.
3. Most schools nowadays prefer to use continuous evaluation, because it gives a fairer picture of how the student has done during the whole year.
4. The land is severely eroded as a result of widespread clearing of forests and intensive farming.
5. This new drug is an important breakthrough in the treatment of cancer.
6. However, the issues involved in determining environmental influence are often complex.
7. All wood used in our furniture comes with a certificate saying it comes from soundly-managed forests.
8. Since deregulation of bus services some routes may have been changed or replaced.

9. Increasingly, the use of land for entertainment is a feature of the Pentland Hills.
10. This has led to a generally narrow viewpoint where resistance to information systems is dismissed as unreasonable.

V. Translate the following sentences into English.

1. 在历时四年的研究中，科学家调查了地球上的许多生境、物种以及将它们联系起来的生态体系。
2. 《千年生态系统评估综合报告》为人们提供了认识生态系统经济价值的全新视角，也为人们尊重和保护地球的生命支持体系提供了新的论据。
3. 科学家认为，水文系统的改变可能导致破坏性洪灾的发生更加频繁和严重。
4. 从经济角度看，与那些被用于商业开发的生态系统相比，很多原始生态系统的价值更高。
5. 如何在利用地球生态系统提高人类生活水平的同时，缓解该系统所承受的压力，完全取决于人类社会。

Guidelines for EST Study

The Main Features of EST

科技英语的主要特点

Among the functional varieties of English, English for science and technology (EST) occupies a very important position due to the vital role played by science and technology in the advancement of human civilization. The invention of the steam engine, for example, brought about the industrial revolution; the study of atoms ushered in the atomic age; and the introduction of computer technology has pushed the world into an electronic age and the age of "information technology (IT)." With the rapid development of science and technology, EST has acquired an ever-growing importance and is exerting more and more influence upon people's lives as well as their use of language.

EST exhibits language features peculiar to its own. When English learners read for the first time a piece of technical writing or hear for the first time scientists' "talking show" in English, they may find it difficult to understand what is written or spoken, particularly if they have learned English as a language of everyday conversation or of

literature. The same may be true even for the English native speakers who are not involved in the related specified field. This is not only because they are not familiar with the specialized subject matter, but also because they are not familiar with the way scientists and engineers express themselves.

1. *Objectivity* (客观性)

Scientists are only interested in matters and processes, in properties and changes, in natural phenomena and scientific laws. All their observations and conclusions have to be based on hard facts. They are trained to be objective. They endeavor to make observations or assumptions that can be proved, and other scientists would agree upon. That is why they have to assume an impersonal objective attitude and make impersonal objective statements. Their objective attitude is naturally reflected in the language they use either in writing or speaking.

2. *Clarity* (明确性)

Owing to the nature of their work, what scientists are most concerned about is how to express themselves clearly. Clarity is essential, especially when they communicate with those who are scientists themselves; there is no need to make their subjects interesting or exciting. In dealing with technical matters, clarity greatly facilitates effective communication between these professionals.

3. *Accuracy* (准确性)

Like clarity, scientific writing and speaking also attaches great importance to accuracy. The success of scientific researches depends on the accuracy of facts, experimental results, and statistics, and this requirement makes it necessary to use accurate language to express the meanings exactly and clearly in scientific studies. Therefore, scientific writing and speaking involves specialized words which are rarely used in literature or everyday conversations to achieve exactness and accuracy.

4. *Formality* (正式)

Scientists are universally regarded as learned men and women working on serious scientific matters. Therefore, their style of writing or speaking should be formal—a proper reflection of the language features of EST mentioned above: objectivity, clarity and accuracy.

I. The Ways to Achieve Objectivity and Formality in EST

1. *The Use of Nouns and Noun Phrases*

In order to achieve objectivity and formality, technical language, especially technical

writing, uses nouns or noun phrases more often in the place of verbs, adjectives, etc.

Compare the following two sentences:

The rate of evaporation of a liquid enormously *depends* on temperature.

The *dependence* of the rate of evaporation of a liquid on temperature is enormous.

2. *The Use of Passive Voice*

In technical language, the personal tone is often improper, and the agent of action is not so important as the action itself because scientists are, as mentioned earlier, only interested in matters and processes, not in the person who does the experiment.

Compare the following two sentences:

We can improve its performance when we use super-heated steam.

An improvement of its performance can be effected by the use of super-heated steam.

3. *The Use of Anticipatory "it"*

Similar to the use of passive voice, anticipatory "it" is also preferred in technical language to reflect the impersonal objective attitude of scientists.

Compare the following two sentences:

Some scientists suggested that this "active nitrogen" consisted of the gas in its atomic state.

It was suggested by some scientists that this "active nitrogen" consisted of the gas in its atomic state.

II. The Ways to Achieve Accuracy in EST

1. *Using Specific Expressions*

Many words and expressions in English have the same or similar meaning, but some are more specific and, therefore, more accurate in meaning.

Compare the following two sentences:

The reflected light was *taken in* by the transducer.

The reflected light was *absorbed* by the transducer. (more specific)

2. *Using Statistics and Figures*

Compare the following two sentences:

Costs can be reduced by this process.

This process consumes *5% less fuel* and produces *12% more power*. (more specific)

I. Compare the following two passages. The first one is an extract from a scientific paper, whereas the second one is extracted from a novel. Then answer the questions.

Passage One

Naturally, a great deal of thought has been given to possible ways of preventing the emergence of resistance. One suggestion has been the use of mixtures of two different types of insecticides, with the idea that one of them should eliminate the individual's resistance to the other. This principle has been found useful in preventing resistance to antibiotics in bacteria. Unfortunately, the few practical trials have not been encouraging, for the mixtures have merely developed a double resistance to the two insecticides employed.

In brief, there is as yet no known way of obtaining the benefits of the new insecticides without some risk of provoking resistance. For this reason, *it* would seem unwise to use insecticide regularly, on a very large scale, unless there is some vital object to be attained. In such cases, the use of insecticides should be combined with other measures.

Passage Two

Soomintra brought the snapshot album. It was an expensive album, covered in leather. They had frequently photographed Ravi, from the time when he was first allowed into the open air until the month before his death. There were pictures of him bathing in the sea, digging sand on the east coast, the north coast, and the south coast; pictures of Ravi dressed up for Carnival, dressed up for tea parties; Ravi on bicycles, Ravi in motor-cars, real ones and toy ones; Ravi in the company of lots of people I didn't know. I turned the pages rather dully. From time to time Sheila leaned forward and commented. "There's Ravi at the home of that American doctor. A wonderful guy. Ravi looks sweet, doesn't he? And look at this one: that boy always had a smile for the camera. He always knew what we were doing. He was a very clever little boy."

At last we exhausted the snapshots. Sheila had become silent towards the end. I felt that she had been *through* the album many times in the last two days.

Questions:

1. How are the first three sentences in the two passages constructed?

2. Are the words spoken by Sheila in Passage Two formal or informal?
3. In the second paragraph of Passage One, what does "it" refer to?
4. In the second paragraph of Passage Two, what does "through" mean?
5. For what purposes do you suppose are these two passages written respectively?

II. Some words and phrases in the following passages are not formal, specific or clear enough for scientific writing. Find them out and replace them with the ones listed below. Change the form where necessary.

exhibit	gain	melting	approximately
combustible	discrete	center	blown
circumference	orbit	install	an equal
eight			

Passage One

A blast of hot air is sent into the bottom of the furnace to make the coke burn fiercely. It is forced into the furnace through pipes. These pipes are put around the circle of the blast furnace several feet above the bottom.

While the coke is burning and iron is becoming soft, gas is formed at the top of the chamber. This is led off from the top of the furnace to be used. It contains carbon monoxide, which can catch fire and burn easily. Part of this gas is used for making the air blast hot. It is led off into stoves.

Passage Two

All elements are composed of scattered units called atoms, which are the smallest particles that show the characteristics of the element. Atoms are tiny units of matter composed of positively charged protons, negatively charged electrons, and electrically neutral neutrons. Protons and neutrons, which have almost the same mass, are clustered in the nucleus in the middle of the atom. Electrons, which are tiny in comparison to the other units, move around the nucleus at high speed. Atoms that have the same number of electrons and protons are electrically neutral. Those that have got or lost electrons, and therefore are positively or negatively charged, are called ions.

Text B

Ozone: Good Up High, Bad Nearby

臭氧的两面性

What Is Ozone[1] ?

Ozone is a gas that occurs both in the Earth's upper atmosphere and at ground level. Ozone can be "good" or "bad" for your health and the environment, depending on its location in the atmosphere.

How Can Ozone Be Both Good and Bad?

Ozone occurs in two layers of the atmosphere. The layer closest to the Earth's surface is the troposphere[2] . Here, ground-level or "bad" ozone is an air **pollutant** that is harmful to breathe and it damages crops, trees and other **vegetation**. It is a main **ingredient** of urban **smog**. The troposphere generally extends to a level about 6 miles up, where it meets the second layer, the stratosphere[3] . The stratosphere or "good" ozone layer extends upward from about 6 to 30 miles and protects life on Earth from the sun's harmful **ultraviolet (UV) rays**.

What Is Happening to the "Good" Ozone Layer?

Ozone is produced naturally in the stratosphere. But this "good" ozone is gradually being destroyed by man-made chemicals referred to as ozone-**depleting** substances (ODS)[4], including chlorofluorocarbons (CFCs)[5], **hydrochlorofluorocarbons** (HCFCs),

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1. ozone: 臭氧
2. troposphere: 对流层。距地球表面约 10 公里，厚度随纬度变化而异。几乎所有的气象变化现象都发生于对流层。
3. stratosphere: 平流层（又称同温层，距地球表面约 10–50 公里）
4. ozone-depleting substances (ODS): 臭氧消耗物质。主要指人工合成的化学物质，如冷凝剂、农药、有机溶剂等。这些物质在强紫外线照射下分解氟、氯等分子，使得臭氧降解，因此被称为臭氧消耗物质。
5. chlorofluorocarbon (CFC): 氯氟碳化合物。一种人工合成的化学物质，用作冷冻剂、清洁剂、抗凝剂、发泡剂、压缩喷雾喷射剂等。由于氯氟碳化合物对臭氧层的破坏日益严重，现正逐步被其他更利于大气环境保护的物质所取代。

halons, **methyl bromide**, **carbon tetrachloride**, and **methyl chloroform**. These substances were formerly used and sometimes still are used in **coolants**, **foaming agents**, **fire extinguishers**, **solvents**, **pesticides**, and aerosol propellants[6]. Once released into the air these ozone-depleting substances degrade very slowly. In fact, they can remain intact for years as they move through the troposphere until they reach the stratosphere. There they are broken down by the intensity of the sun's UV rays and release **chlorine** and **bromine** molecules, which destroy the "good" ozone. Scientists estimate that one chlorine atom can destroy 100,000 "good" ozone molecules.

Even though we have reduced or eliminated the use of many ODS, their use in the past can still affect the protective ozone layer. Research indicates that **depletion** of the "good" ozone layer is being reduced worldwide. Thinning of the protective ozone layer can be observed using satellite measurements, particularly over the **Polar** Regions.

How Does the Depletion of "Good" Ozone Affect Human Health and the Environment?

Ozone depletion can cause increased amounts of UV radiation to reach the Earth which can lead to more cases of skin cancer, **cataracts**, and **impaired immune systems**. Overexposure to UV is believed to be contributing to the increase in **melanoma**, the most fatal of all skin cancers. Since 1990, the risk of developing melanoma has more than doubled.

UV can also damage sensitive crops, such as **soybeans**, and reduce crop yields. Some scientists suggest that **marine phytoplankton**, which are the base of the ocean food chain, are already under stress from UV radiation. This stress could have **adverse** consequences for human food supplies from the oceans.

What Is Being Done About the Depletion of "Good" Ozone?

The United States, along with over 180 other countries, recognized the threats posed by ozone depletion and in 1987 adopted a treaty called the Montreal Protocol[7] to **phase**

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6. aerosol propellant: 汽溶胶推进剂，喷剂。汽溶胶是由固体或液体小质点分散并悬浮在气体介质中形成的胶体分散体系，作为喷雾、发泡产品的推进剂，被广泛地用于美容美发、消毒、除虫、清洁卫生、医疗医药、油漆装潢、饮食、园艺等领域。汽溶胶中含有 CFC，对臭氧有破坏作用。
7. Montreal Protocol:《蒙特利尔议定书》。签署于 1987 年 9 月 16 日的一项国际协议，目的是采取国际协调行动，减少臭氧消耗物质的排放量，以保护大气臭氧层。

out the production and use of ozone-depleting substances.

EPA (Environmental Protection Agency)[8] has established regulations to phase out ozone-depleting chemicals in the United States. Warning labels must be placed on all products containing CFCs or similar substances and nonessential uses of ozone-depleting products are prohibited. Releases into the air of **refrigerants** used in car and home air conditioning units and appliances are also prohibited. Some substitutes to ozone-depleting products have been produced and others are being developed. If the United States and other countries stop producing ozone-depleting substances, natural ozone production should return the ozone layer to normal levels by about 2050.

What Causes "Bad" Ozone?

Ground-level or "bad" ozone is not **emitted** directly into the air, but is created by chemical reactions between oxides of nitrogen (NOx)[9] and volatile organic compounds (VOC)[10] in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle **exhaust**, gasoline vapors, and chemical solvents are some of the major sources of NOx and VOC.

At ground level, ozone is a harmful pollutant. Ozone pollution is a concern during the summer months because strong sunlight and hot weather result in harmful ozone concentrations in the air we breathe. Many urban and suburban areas throughout the United States have high levels of "bad" ozone. But many rural areas of the country are also subject to high ozone levels as winds carry **emissions** hundreds of miles away from their original sources.

How Does "Bad" Ozone Affect Human Health and the Environment?

Breathing ozone can trigger a variety of health problems including chest pain,

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8. EPA (Environmental Protection Agency):（美国）环境保护署。由于公众对清洁的大气、土壤和水环境的呼声渐增，美国白宫和国会于1970年7月合作组建该机构。其宗旨和使命是：保护环境，保障国民健康安全。
9. oxides of nitrogen (NOx): 氮氧化物（主要指一氧化氮和二氧化氮，是对人体有害的气体）。氮氧化物和碳氢化合物在大气环境中受强烈的太阳紫外线照射后产生一种新的二次污染物——光化学烟雾。
10. volatile organic compounds (VOC): 挥发性有机化合物（指在常压下，沸点 50℃–260℃ 的各种有机化合物）。按其化学结构，可以进一步分为：烷类、芳烃类、烯类、卤烃类、酯类、醛类等。目前已鉴定出的有 300 多种。

coughing, throat **irritation**, and **congestion**. It can worsen **bronchitis**, **emphysema**, and **asthma**. "Bad" ozone also can reduce lung function and **inflame** the **linings** of the lungs. Repeated exposure may permanently scar lung tissue.

Healthy people also experience difficulty breathing when exposed to ozone pollution. Because ozone forms in hot weather, anyone who spends time outdoors in the summer may be affected, particularly children, outdoor workers and people exercising. Millions of Americans live in areas where the national ozone health standards are exceeded.

Ground-level or "bad" ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields, reduced growth and **survivability** of tree **seedlings**, and increased **susceptibility** to diseases, pests and other stresses such as harsh weather. In the United States alone, ground-level ozone is responsible for an estimated $500 million in reduced crop production each year. Ground-level ozone also damages the **foliage** of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas.

What Is Being Done About "Bad" Ozone?

Under the Clean Air Act[11], EPA has set protective health-based standards for ozone in the air we breathe. EPA, states, and cities have instituted a variety of **multi-faceted** programs to meet these health-based standards. Throughout the country, additional programs are being put into place to cut NOx and VOC emissions from vehicles, industrial facilities, and electric utilities. Programs are also aimed at reducing pollution by reformulating fuels and consumer / commercial products, such as paints and chemical solvents that contain VOC. Voluntary programs also encourage communities to adopt practices, such as **carpooling**, to reduce harmful emissions.

Actions You Can Take

High-Altitude "Good" Ozone

Protect yourself against sunburn. When the UV Index[12] is "high" or "very high":

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11. Clean Air Act:《清洁空气法》(美国 1990 年通过的一部联邦法令)。在此法律文件中，环境保护署限定了各地空气中污染物的排放量。
12. UV Index: 紫外线指数（是美国国家气象局和环境保护署每日联合发布的一种紫外线强度指数，预防户外活动者被紫外线灼伤)。指数级别为 1 级至 11^+ 级，1 级表示风险最低，11^+ 级表示极端危险。

Limit outdoor activities between 10 a.m. and 4 p.m., when the sun is most intense. Twenty minutes before going outside, liberally apply a broad-spectrum **sunscreen** with a Sun Protection Factor (SPF)[13] of at least 15. Reapply every two hours or after swimming or sweating.

Use approved refrigerants in air conditioning and refrigeration equipment. Make sure technicians that work on your car or home air conditioners or refrigerator are certified to recover the refrigerant. Repair leaky air conditioning units before refilling them.

Ground-Level "Bad" Ozone

Check the air quality forecast in your area. At times when the Air Quality Index (AQI)[14] is forecast to be unhealthy, limit physical **exertion** outdoors. In many places, ozone peaks in mid-afternoon to early evening. Change the time of day of **strenuous** outdoor activity to avoid these hours, or reduce the intensity of the activity. For AQI forecasts, check your local media reports or visit http://www.epa.gov/airnow.

Help your local electric utilities reduce ozone air pollution by conserving energy at home and the office. Consider setting your **thermostat** a little higher in the summer. Participate in your local utilities' load-sharing and energy conservation programs.

Reduce air pollution from cars, trucks, gas-powered lawn and garden equipment, boats and other engines by keeping equipment properly tuned and maintained. During the summer, fill your gas tank during the cooler evening hours and be careful not to spill gasoline. Reduce driving, **carpool**, use public transportation, walk, or bicycle to reduce ozone pollution, especially on hot summer days.

Use household and garden chemicals wisely. Use low VOC paints and solvents. And be sure to read labels for proper use and disposal.

Words & Expressions

adverse	*adj.*	不利的，有害的
asthma	*n.*	哮喘
bromine	*n.*	溴化物

13. Sun Protection Factor (SPF): 防晒指数（表明防晒用品防晒功效的高低）。某防晒化妆品的防晒指数即，经该化妆品防护的皮肤产生红斑所需的最短照射时间与未经防护的皮肤产生红斑所需的最短照射时间的比值。
14. Air Quality Index (AQI): 空气质量指数。该指数为美国环境保护署关于空气质量的一个衡量标志系数，采用 0–500 的数字和颜色表征空气质量；该指数越大，空气质量越差。

bronchitis	*n.*	支气管炎
carbon tetrachloride		四氯化碳
carpool	*v.*	合伙使用汽车，拼车
carpooling	*n.*	合伙使用汽车，拼车
cataracts	*n.*	白内障
chlorine	*n.*	氯
congestion	*n.*	充血
coolant	*n.*	冷却剂；减热润滑剂
deplete	*v.*	耗尽，大大减少
depletion	*n.*	耗尽，竭尽
emission	*n.*	发出物；发射物
emit	*v.*	散发；发射（光、热、声音、气味等）
emphysema	*n.*	肺气肿
exertion	*n.*	努力，费力
exhaust	*n.*	（排出的）废气，废液
fire extinguisher		灭火器
foaming agent		起泡剂，发泡剂
foliage	*n.*	叶子，树叶
halon	*n.*	二氟二氯甲烷
hydrochlorofluorocarbon	*n.*	氢氯氟碳化合物，含氯氟烃
immune system		免疫系统
impaired	*adj.*	受损的
inflame	*v.*	使红肿
ingredient	*n.*	成分，因素
irritation	*n.*	疼痛；发炎
lining	*n.*	（器官内壁的）组织；膜
marine phytoplankton		海洋浮游植物
melanoma	*n.*	（恶性）黑素瘤
methyl bromide		溴化甲烷
methyl chloroform		三氯乙烷
multi-faceted	*adj.*	多方面的
pesticide	*n.*	杀虫剂；农药
phase out		使逐步结束；逐步淘汰
polar	*adj.*	地极的；极地的

pollutant	*n.*	污染物
refrigerant	*n.*	制冷剂
seedling	*n.*	秧苗；树苗
smog	*n.*	（常指工业区烟和雾混合而成的）烟雾
solvent	*n.*	溶剂，溶媒
soybean	*n.*	大豆；黄豆
strenuous	*adj.*	使劲的；激烈的
sunscreen	*n.*	防晒霜，防晒油
survivability	*n.*	耐受性；生命力
susceptibility	*n.*	敏感性；过敏性
thermostat	*n.*	自动调温器；恒温器
ultraviolet (UV) rays		紫外线
vegetation	*n.*	植被；（总称）植物

Exercises

I. There are five questions and unfinished statements in this exercise. For each question or statement there are four choices marked A, B, C, and D. Decide on the best choice.

1. How thick is the stratosphere?
   A. Around 6 miles.　　B. Around 30 miles.
   C. Around 24 miles.　　D. Around 36 miles.
2. ODS are broken by the sun's UV rays at stratosphere and _____.
   A. cool the atmosphere
   B. remain stagnant in the air for years
   C. release substances that are harmful to the "good" ozone
   D. form a protective ozone layer
3. The EPA did all of the following EXCEPT _____ to phase out ozone-depleting chemicals.
   A. prohibiting the use of car and home air conditioning units
   B. formulating strict regulations concerning products containing CFCs
   C. placing a ban on the nonessential use of ozone-depleting products
   D. encouraging the production and development of alternative coolants

4. How is the “bad” ozone at ground level formed?
   A. It is directly released into the air by industrial facilities.
   B. Its origin can be traced to rural areas.
   C. It is released by the chemical reactions between NOx and VOC under the sunlight.
   D. It is forced down into the troposphere by high air pressure up in the stratosphere.
5. Ozone at ground level is harmful in that _____.
   A. it deprives people of exposure to the warm sunshine
   B. it may result in serious health hazards to both ailing and healthy people
   C. it brings about harsh weather and other extreme climates
   D. it exceeds the national ozone health standards set by the EPA

II. Match the Chinese terms with their English equivalents.

1. 挥发性有机化合物	A. troposphere
2. 平流层	B. solvent
3. 防晒指数	C. ozone-depleting substances (OPS)
4. 溶剂	D. refrigerant
5. 气溶胶喷射剂	E. volatile organic compounds (VOC)
6. 制冷剂	F. UV Index
7. 免疫系统	G. oxide
8. 发泡剂	H. aerosol propellant
9. 紫外线指数	I. immune system
10. 污染物	J. Sun Protection Factor (SPF)
11. 对流层	K. susceptibility to diseases
12. 氧化物	L. thermostat
13. 疾病易感性	M. foaming agent
14. 恒温器	N. pollutant
15. 臭氧消耗物质	O. stratosphere

III. Translate the following into Chinese.

What Causes “Bad” Ozone?

Ground-level or “bad” ozone is not emitted directly into the air, but is created by

chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NOx and VOC.

At ground level, ozone is a harmful pollutant. Ozone pollution is a concern during the summer months because strong sunlight and hot weather result in harmful ozone concentrations in the air we breathe. Many urban and suburban areas throughout the United States have high levels of "bad" ozone. But many rural areas of the country are also subject to high ozone levels as winds carry emissions hundreds of miles away from their original sources.

How Does "Bad" Ozone Affect Human Health and the Environment?

Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. "Bad" ozone also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue.

Healthy people also experience difficulty breathing when exposed to ozone pollution. Because ozone forms in hot weather, anyone who spends time outdoors in the summer may be affected, particularly children, outdoor workers and people exercising. Millions of Americans live in areas where the national ozone health standards are exceeded.

Ground-level or "bad" ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields, reduced growth and survivability of tree seedlings, and increased susceptibility to diseases, pests and other stresses such as harsh weather. In the United States alone, ground-level ozone is responsible for an estimated $500 million in reduced crop production each year. Ground-level ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas.