

## 【雅思无忧】雅思阅读讲义

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### 第一课 雅思阅读概述和填空题

#### 第一篇

#### Let's Go Bats

A Bats have a problem: how to find their way around in the dark. They hunt at night, and cannot use light to help them find prey and avoid obstacles. You might say that this is a problem of their own making, one that they could avoid simply by changing their habits and hunting by day. But the daytime economy is already heavily exploited by other creatures such as birds. Given that there is a living to be made at night, and given that alternative daytime trades are thoroughly occupied, natural selection has favoured bats that make a go of the night-hunting trade. It is probable that the nocturnal trades go way back in the ancestry of all mammals.

B Bats have an engineering problem: how to find their way and find their prey in the absence of light. Bats are not the only creatures to face this difficulty today. Obviously the night-flying insects that they prey on must find their way about somehow. Deep-sea fish and whales have little or no light by day or by night. Fish and dolphins that live in extremely muddy water cannot see because, although there is light, it is obstructed and scattered by the dirt in the water. Plenty of other modern animals make their living in conditions where seeing is difficult or impossible.

C Given the questions of how to manoeuvre in the dark, what solutions might an engineer consider? The first one that might occur to him is to manufacture light, to use a lantern or a searchlight. Fireflies and some fish (usually with the help of bacteria) have the power to manufacture their own light, but the process seems to consume a large amount of energy. Fireflies use their light for attracting mates. This doesn't require a prohibitive amount of energy: a male's tiny pinprick of light can be seen by a female from some distance on a dark night, since her eyes are exposed directly to the light source itself. However, using light to find one's own way around requires vastly more energy, since the eyes have to detect the tiny fraction of the light that bounces off each part of the scene. The light source must therefore be immensely brighter if it is to be used as a headlight to illuminate the path, than if it is to be used as a signal to others.

D What else might the engineer think of? well, blind humans sometimes seem to have an uncanny sense of obstacles in their path. It has been given the name 'facial vision', because blind people have reported that it feels a bit like the sense of touch, on the face. One report tells of a totally blind boy who could ride his tricycle at good speed round the block near his home, using facial vision. Experiments showed that, in fact, facial vision is nothing to do with touch or the front of the face, although the sensation may be referred to the front of the face, like the referred pain in a phantom limb. The sensation of facial vision, it turns out, really goes in through the ears. Blind people, without even being aware of the fact, are actually using echoes of their own footsteps and of other sounds, to sense the presence of obstacles. Before this was discovered, engineers had already built instruments to exploit the principle, for example to measure the depth of the sea under a ship. After this technique had been invented, it was only a matter of time before weapons designers adapted it for the detection of submarines. Both sides in the Second world war relied heavily on these devices, under such codenames as Asdic (British) and Sonar (American), as well as Radar (American) or RDF (British), which uses radio echoes rather than sound echoes.

E The Sonar and Radar pioneers didn't know it then, but all the world now knows that bats, or rather natural selection working on bats, had perfected the system tens of millions of years earlier, and their 'radar' achieves feats of detection and navigation that would strike an engineer dumb with admiration. It is technically incorrect to talk about bat 'radar', since they do not use radio waves. It is sonar. But the underlying mathematical theories of radar and sonar are very similar, and much of our scientific understanding of the details of what bats are doing has come from applying radar theory to them.

#### Questions 6-9

Complete the summary below.

Choose **ONE WORD ONLY** from the passage for each answer.

Write your answers in boxes 6-9 on your answer sheet.

#### Facial Vision

Blind people report that so-called 'facial vision' is comparable to the sensation of touch on the face. In fact, the sensation is more similar to the way in which pain from a 6..... arm or leg might be felt. The ability actually comes from perceiving 7..... through the ears. However, even before this was understood, the principle had been applied in the design of instruments which calculated the 8..... of the seabed. This was followed by a wartime application in devices for finding 9..... .

## 第二篇

### BAKELITE

#### The birth of modern plastics

In 1907, Leo Hendrick Baekeland, a Belgian scientist working in New York, discovered and patented a revolutionary new synthetic material. His invention, which he named 'Bakelite', was of enormous technological importance, and effectively launched the modern plastics industry.

The term 'plastic' comes from the Greek *plassein*, meaning 'to mould'. Some plastics are derived from natural sources, some are semi-synthetic (the result of chemical action on a natural substance), and some are entirely synthetic, that is, chemically engineered from the constituents of coal or oil. Some are 'thermoplastic', which means that, like candlewax, they melt when heated and can then be reshaped. Others are 'thermosetting': like eggs, they cannot revert to their original viscous state, and their shape is thus fixed for ever. Bakelite had the distinction of being the first totally synthetic thermosetting plastic.

The history of today's plastics begins with the discovery of a series of semi-synthetic thermoplastic materials in the mid-nineteenth century. The impetus behind the development of these early plastics was generated by a number of factors - immense technological progress in the domain of chemistry, coupled with wider cultural changes, and the pragmatic need to find acceptable substitutes for dwindling supplies of 'luxury' materials such as tortoiseshell and ivory.

Baekeland's interest in plastics began in 1885 when, as a young chemistry student in Belgium, he embarked on research into phenolic resins, the group of sticky substances produced when phenol (carbolic acid) combines with an aldehyde (a volatile fluid similar to alcohol). He soon abandoned the subject, however, only returning to it some years later. By 1905 he was a wealthy New Yorker, having recently made his fortune with the invention of a new photographic paper. While Baekeland had been busily amassing dollars, some advances had been made in the development of plastics. The years 1899 and 1900 had seen the patenting of the first semi-synthetic thermosetting material that could be manufactured on an industrial scale. In purely scientific terms, Baekeland's major contribution to the field is not so much the actual discovery of the material to which he gave his name, but rather the method by which a reaction between phenol and formaldehyde could be controlled, thus making possible its preparation on a commercial basis. On 13 July 1907, Baekeland took out his famous patent describing this preparation, the essential features of which are still in use today.

The original patent outlined a three-stage process, in which phenol and formaldehyde (from wood or coal) were initially combined under vacuum inside a large egg-shaped kettle. The result was a resin known as Novalak, which became soluble and malleable when heated. The resin was allowed to cool in shallow trays until it

hardened, and then broken up and ground into powder. Other substances were then introduced: including fillers, such as woodflour, asbestos or cotton, which increase strength and moisture resistance, catalysts (substances to speed up the reaction between two chemicals without joining to either) and hexa, a compound of ammonia and formaldehyde which supplied the additional formaldehyde necessary to form a thermosetting resin. This resin was then left to cool and harden, and ground up a second time. The resulting granular powder was raw Bakelite, ready to be made into a vast range of manufactured objects. In the last stage, the heated Bakelite was poured into a hollow mould of the required shape and subjected to extreme heat and pressure, thereby 'setting' its form for life.

The design of Bakelite objects, everything from earrings to television sets, was governed to a large extent by the technical requirements of the moulding process. The object could not be designed so that it was locked into the mould and therefore difficult to extract. A common general rule was that objects should taper towards the deepest part of the mould, and if necessary the product was moulded in separate pieces. Moulds had to be carefully designed so that the molten Bakelite would flow evenly and completely into the mould. Sharp corners proved impractical and were thus avoided, giving rise to the smooth, 'streamlined' style popular in the 1930s. The thickness of the walls of the mould was also crucial: thick walls took longer to cool and harden, a factor which had to be considered by the designer in order to make the most efficient use of machines.

Baekeland's invention, although treated with disdain in its early years, went on to enjoy an unparalleled popularity which lasted throughout the first half of the twentieth century. It became the wonder product of the new world of industrial expansion - 'the material of a thousand uses'. Being both non-porous and heat-resistant, Bakelite kitchen goods were promoted as being germ-free and sterilisable. Electrical manufacturers seized on its insulating properties, and consumers everywhere relished its dazzling array of shades, delighted that they were now, at last, no longer restricted to the wood tones and drab browns of the pre-plastic era. It then fell from favour again during the 1950s, and was despised and destroyed in vast quantities. Recently, however, it has been experiencing something of a renaissance, with renewed demand for original Bakelite objects in the collectors' marketplace, and museums, societies and dedicated individuals once again appreciating the style and originality of this innovative material.

### Questions 1-3

Complete the summary.

Choose **ONE WORD ONLY** from the passage for each answer.

Write your answers in boxes 1-3 on your answer sheet.

Some plastics behave in a similar way to 1 ..... in that they melt under heat and can be moulded into new forms. Bakelite was unique because it was the first material to be both entirely 2 ..... in origin, and thermosetting. There were several reasons for the research into plastics in the nineteenth century, among them the great advances that had been made in the field of 3 ..... and the search for alternatives to natural resources like ivory.

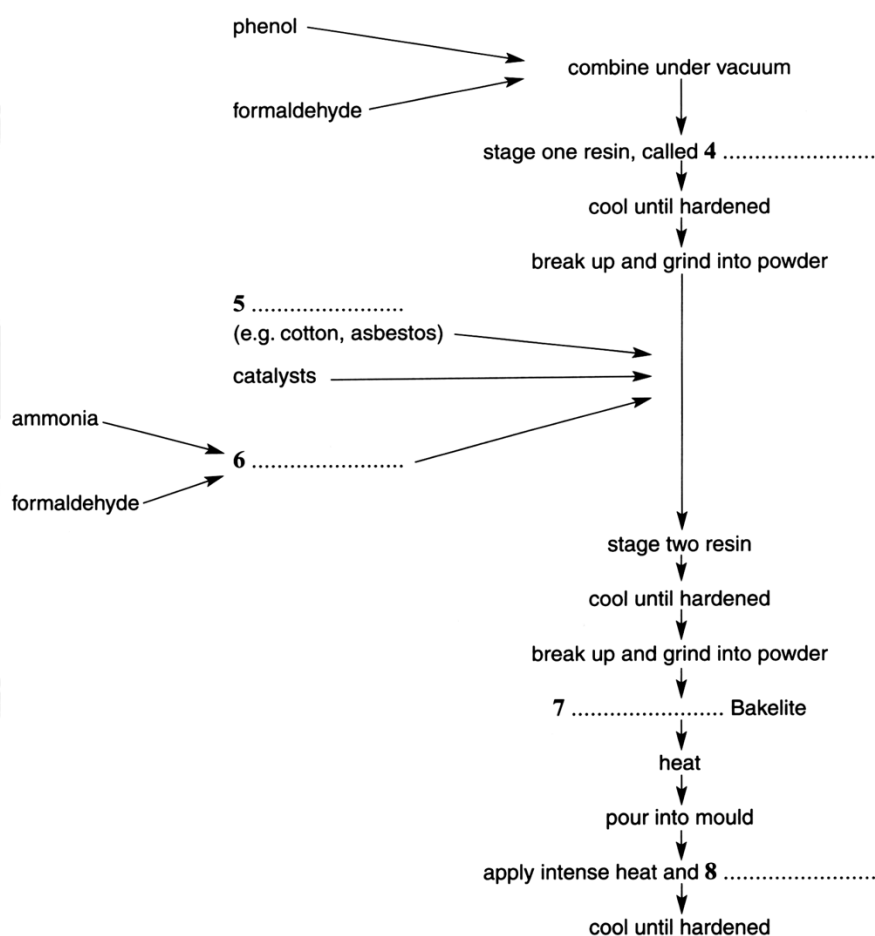
### Questions 4-8

Complete the flow-chart.

Choose **ONE WORD ONLY** from the passage for each answer.

Write your answers in boxes 4-8 on your answer sheet.

## The Production of Bakelite



第三篇

## THE LITTLE ICE AGE

A This book will provide a detailed examination of the Little Ice Age and other climatic shifts, but, before I embark on that, let me provide a historical context. We tend to think of climate - as opposed to weather - as something unchanging, yet humanity has been at the mercy of climate change for its entire existence, with at least eight glacial episodes in the past 730,000 years. Our ancestors adapted to the universal but irregular global warming since the end of the last great Ice Age, around 10,000 years ago, with dazzling opportunism. They developed strategies for surviving harsh drought cycles, decades of heavy rainfall or unaccustomed cold; adopted agriculture and stock-raising, which revolutionised human life; and founded the world's first pre-industrial civilisations in Egypt, Mesopotamia and the Americas. But the price of sudden climate change, in famine, disease and suffering, was often high.

B The Little Ice Age lasted from roughly 1300 until the middle of the nineteenth century. Only two centuries ago, Europe experienced a cycle of bitterly cold winters; mountain glaciers in the Swiss Alps were the lowest in recorded memory, and pack ice surrounded Iceland for much of the year. The climatic events of the Little Ice Age did more than help shape the modern world. They are the deeply important context for the current unprecedented global warming. The Little Ice Age was far from a deep freeze, however; rather an irregular seesaw of rapid climatic shifts, few lasting more than a quarter-century, driven by complex and still little understood interactions between the atmosphere and the ocean. The seesaw brought cycles of intensely cold winters and easterly winds, then switched abruptly to years of heavy spring and early summer rains, mild winters, and frequent Atlantic storms, or to periods of droughts, light northeasterly winds, and summer heat waves.

C Reconstructing the climate changes of the past is extremely difficult, because systematic weather observations began only a few centuries ago, in Europe and North America. Records from India and tropical Africa are even more recent. For the time before records began, we have only 'proxy records' reconstructed largely from tree rings and ice cores, supplemented by a few incomplete written accounts. We now have hundreds of tree-ring records from throughout the northern hemisphere, and many from south of the equator, too, amplified with a growing body of temperature data from ice cores drilled in Antarctica, Greenland, the Peruvian Andes, and other locations. We are close to a knowledge of annual summer and winter temperature variations over much of the northern hemisphere going back 600 years.

D This book is a narrative history of climatic shifts during the past ten centuries, and some of the ways in



which people in Europe adapted to them. Part One describes the Medieval Warm Period, roughly 900 to 1200. During these three centuries, Norse voyagers from Northern Europe explored northern seas, settled Greenland, and visited North America. It was not a time of uniform warmth, for then, as always since the Great Ice Age, there were constant shifts in rainfall and temperature. Mean European temperatures were about the same as today, perhaps slightly cooler.

E It is known that the Little Ice Age cooling began in Greenland and the Arctic in about 1200. As the Arctic ice pack spread southward, Norse voyages to the west were rerouted into the open Atlantic, then ended altogether. Storminess increased in the North Atlantic and North Sea. Colder, much wetter weather descended on Europe between 1315 and 1319, when thousands perished in a continent-wide famine. By 1400, the weather had become decidedly more unpredictable and stormier, with sudden shifts and lower temperatures that culminated in the cold decades of the late sixteenth century. Fish were a vital commodity in growing towns and cities, where food supplies were a constant concern. Dried cod and herring were already the staples of the European fish trade, but changes in water temperatures forced fishing fleets to work further offshore. The Basques, Dutch, and English developed the first offshore fishing boats adapted to a colder and stormier Atlantic. A gradual agricultural revolution in northern Europe stemmed from concerns over food supplies at a time of rising populations. The revolution involved intensive commercial farming and the growing of animal fodder on land not previously used for crops. The increased productivity from farmland made some countries self-sufficient in grain and livestock and offered effective protection against famine.

F Global temperatures began to rise slowly after 1850, with the beginning of the Modern Warm Period. There was a vast migration from Europe by land-hungry farmers and others, to which the famine caused by the Irish potato blight contributed, to North America, Australia, New Zealand, and southern Africa. Millions of hectares of forest and woodland fell before the newcomers' axes between 1850 and 1890, as intensive European farming methods expanded across the world. The unprecedented land clearance released vast quantities of carbon dioxide into the atmosphere, triggering for the first time humanly caused global warming. Temperatures climbed more rapidly in the twentieth century as the use of fossil fuels proliferated and greenhouse gas levels continued to soar. The rise has been even steeper since the early 1980s. The Little Ice Age has given way to a new climatic regime, marked by prolonged and steady warming. At the same time, extreme weather events like Category 5 hurricanes are becoming more frequent.

#### Questions 18-22

Complete the summary using the list of words, **A-I**, below.

Write the correct letter, A-I, in boxes 18-22 on your answer sheet.

## Weather during the Little Ice Age

Documentation of past weather conditions is limited: our main sources of knowledge of conditions in the distant past are 18 ..... and 19 ..... . We can deduce that the Little Ice Age was a time of 20 ....., rather than of consistent freezing. Within it there were some periods of very cold winters, others of 21 ..... and heavy rain, and yet others that saw 22 ..... with no rain at all.

- |                   |                |                        |
|-------------------|----------------|------------------------|
| A climatic shifts | B ice cores    | C tree rings           |
| D glaciers        | E interactions | F weather observations |
| G heat waves      | H storms       | I written accounts     |

### 第二课 配对题

#### 第一篇

### EFFECTS OF NOISE

In general, it is plausible to suppose that we should prefer peace and quiet to noise. And yet most of us have had the experience of having to adjust to sleeping in the mountains or the countryside because it was initially 'too quiet', an experience that suggests that humans are capable of adapting to a wide range of noise levels. Research supports this view. For example, Glass and Singer (1972) exposed people to short bursts of very loud noise and then measured their ability to work out problems and their physiological reactions to the noise. The noise was quite disruptive at first, but after about four minutes the subjects were doing just as well on their tasks as control subjects who were not exposed to noise. Their physiological arousal also declined quickly to the same levels as those of the control subjects.

But there are limits to adaptation and loud noise becomes more troublesome if the person is required to concentrate on more than one task. For example, high noise levels interfered with the performance of subjects who were required to monitor three dials at a time, a task not unlike that of an aeroplane pilot or an air-traffic controller (Broadbent, 1957). Similarly, noise did not affect a subject's ability to track a moving line with a steering wheel, but it did interfere with the subject's ability to repeat numbers while tracking (Finkelman and Glass, 1970).

Probably the most significant finding from research on noise is that its predictability is more important than how loud it is. We are much more able to 'tune out' chronic background noise, even if it is quite loud, than to



work under circumstances with unexpected intrusions of noise. In the Glass and Singer study, in which subjects were exposed to bursts of noise as they worked on a task, some subjects heard loud bursts and others heard soft bursts. For some subjects, the bursts were spaced exactly one minute apart (predictable noise); others heard the same amount of noise overall, but the bursts occurred at random intervals (unpredictable noise). Subjects reported finding the predictable and unpredictable noise equally annoying, and all subjects performed at about the same level during the noise portion of the experiment. But the different noise conditions had quite different after-effects when the subjects were required to proofread written material under conditions of no noise.

Predictability is not the only variable that reduces or eliminates the negative effects of noise. Another is control. If the individual knows that he or she can control the noise, this seems to eliminate both its negative effects at the time and its after-effects. This is true even if the individual never actually exercises his or her option to turn the noise off (Glass and Singer, 1972).

The studies discussed so far exposed people to noise for only short periods and only transient effects were studied. But the major worry about noisy environments is that living day after day with chronic noise may produce serious, lasting effects. One study, suggesting that this worry is a realistic one, compared elementary school pupils who attended schools near Los Angeles's busiest airport with students who attended schools in quiet neighbourhoods (Cohen et al., 1980). It was found that children from the noisy schools had higher blood pressure and were more easily distracted than those who attended the quiet schools. Moreover, there was no evidence of adaptability to the noise. In fact, the longer the children had attended the noisy schools, the more distractible they became. The effects also seem to be long lasting. A follow-up study showed that children who were moved to less noisy classrooms still showed greater distractibility one year later than students who had always been in the quiet schools (Cohen et al, 1981). It should be noted that the two groups of children had been carefully matched by the investigators so that they were comparable in age, ethnicity, race, and social class.

#### Questions 35-40

Look at the following statements (Questions 35-40) and the list of researchers below.

Match each statement with the correct researcher(s), A-E.

**NB** You may use any letter more than once.

- 35 Subjects exposed to noise find it difficult at first to concentrate on problem-solving tasks.
- 36 Long-term exposure to noise can produce changes in behaviour which can still be observed a year later.
- 37 The problems associated with exposure to noise do not arise if the subject knows they can make it stop.

- 38 Exposure to high-pitched noise results in more errors than exposure to low-pitched noise.
- 39 Subjects find it difficult to perform three tasks at the same time when exposed to noise.
- 40 Noise affects a subject's capacity to repeat numbers while carrying out another task.

**List of Researchers**

- A Glass and Singer
- B Broadbent
- C Finkelman and Glass
- D Cohen et al.
- E None of the above

第二篇

**What's so funny?**

John McCrone reviews recent research on humour

Theories about humour have an ancient pedigree. Plato expressed the idea that humour is simply a delighted feeling of superiority over others. Kant and Freud felt that joke-telling relies on building up a psychic tension which is safely punctured by the ludicrousness of the punchline. But most modern humour theorists have settled on some version of Aristotle's belief that jokes are based on a reaction to or resolution of incongruity, when the punchline is either a nonsense or, though appearing silly, has a clever second meaning.

Graeme Ritchie, a computational linguist in Edinburgh, studies the linguistic structure of jokes in order to understand not only humour but language understanding and reasoning in machines. He says that while there is no single format for jokes, many revolve around a sudden and surprising conceptual shift. A comedian will present a situation followed by an unexpected interpretation that is also apt.

So even if a punchline sounds silly, the listener can see there is a clever semantic fit and that sudden mental 'Aha!' is the buzz that makes us laugh. Viewed from this angle, humour is just a form of creative insight, a sudden leap to a new perspective.

Both social and cognitive types of laughter tap into the same expressive machinery in our brains, the emotion and motor circuits that produce smiles and excited vocalisations. However, if cognitive laughter is the product of more general thought processes, it should result from more expansive brain activity.

Although Goel felt being inside a brain scanner was hardly the ideal place for appreciating a joke, he found evidence that understanding a joke involves a widespread mental shift. His scans showed that at the beginning

of a joke the listener's prefrontal cortex lit up, particularly the right prefrontal believed to be critical for problem solving. But there was also activity in the temporal lobes at the side of the head (consistent with attempts to rouse stored knowledge) and in many other brain areas. Then when the punchline arrived, a new area sprang to life - the orbital prefrontal cortex. This patch of brain tucked behind the orbits of the eyes is associated with evaluating information.

Making a rapid emotional assessment of the events of the moment is an extremely demanding job for the brain, animal or human. Energy and arousal levels may need to be retuned in the blink of an eye. These abrupt changes will produce either positive or negative feelings. The orbital cortex, the region that becomes active in Goel's experiment, seems the best candidate for the site that feeds such feelings into higher-level thought processes, with its close connections to the brain's sub-cortical arousal apparatus and centres of metabolic control.

All warm-blooded animals make constant tiny adjustments in arousal in response to external events, but humans, who have developed a much more complicated internal life as a result of language, respond emotionally not only to their surroundings, but to their own thoughts. Whenever a sought-for answer snaps into place, there is a shudder of pleased recognition. Creative discovery being pleasurable, humans have learned to find ways of milking this natural response. The fact that jokes tap into our general evaluative machinery explains why the line between funny and disgusting, or funny and frightening, can be so fine. Whether a joke gives pleasure or pain depends on a person's outlook.

Humour may be a luxury, but the mechanism behind it is no evolutionary accident. As Peter Derks, a psychologist at William and Mary College in Virginia, says: 'I like to think of humour as the distorted mirror of the mind. It's creative, perceptual, analytical and lingual. If we can figure out how the mind processes humour, then we'll have a pretty good handle on how it works in general.'

#### Questions 24-27

Complete each sentence with the correct ending **A-G** below.

Write the correct letter **A-G** in boxes 24-27 on your answer sheet.

- 24 One of the brain's most difficult tasks is to
- 25 Because of the language they have developed, humans
- 26 Individual responses to humour
- 27 Peter Derks believes that humour

- A react to their own thoughts.
- B helped create language in humans.
- C respond instantly to whatever is happening.
- D may provide valuable information about the operation of the brain.
- E cope with difficult situations.
- F relate to a person's subjective views.
- G led our ancestors to smile and then laugh.

### 第三篇

#### Let's Go Bats

A Bats have a problem: how to find their way around in the dark. They hunt at night, and cannot use light to help them find prey and avoid obstacles. You might say that this is a problem of their own making, one that they could avoid simply by changing their habits and hunting by day. But the daytime economy is already heavily exploited by other creatures such as birds. Given that there is a living to be made at night, and given that alternative daytime trades are thoroughly occupied, natural selection has favoured bats that make a go of the night-hunting trade. It is probable that the nocturnal trades go way back in the ancestry of all mammals. In the time when the dinosaurs dominated the daytime economy, our mammalian ancestors probably only managed to survive at all because they found ways of scraping a living at night. Only after the mysterious mass extinction of the dinosaurs about 65 million years ago were our ancestors able to emerge into the daylight in any substantial numbers.

B Bats have an engineering problem: how to find their way and find their prey in the absence of light. Bats are not the only creatures to face this difficulty today. Obviously the night-flying insects that they prey on must find their way about somehow. Deep-sea fish and whales have little or no light by day or by night. Fish and dolphins that live in extremely muddy water cannot see because, although there is light, it is obstructed and scattered by the dirt in the water. Plenty of other modern animals make their living in conditions where seeing is difficult or impossible.

C Given the questions of how to manoeuvre in the dark, what solutions might an engineer consider? The first one that might occur to him is to manufacture light, to use a lantern or a searchlight. Fireflies and some fish (usually with the help of bacteria) have the power to manufacture their own light, but the process seems to consume a large amount of energy. Fireflies use their light for attracting mates. This doesn't require a prohibitive

amount of energy: a male's tiny pinprick of light can be seen by a female from some distance on a dark night, since her eyes are exposed directly to the light source itself. However, using light to find one's own way around requires vastly more energy, since the eyes have to detect the tiny fraction of the light that bounces off each part of the scene. The light source must therefore be immensely brighter if it is to be used as a headlight to illuminate the path, than if it is to be used as a signal to others. In any event, whether or not the reason is the energy expense, it seems to be the case that, with the possible exception of some weird deep-sea fish, no animal apart from man uses manufactured light to find its way about.

D What else might the engineer think of? well, blind humans sometimes seem to have an uncanny sense of obstacles in their path. It has been given the name 'facial vision', because blind people have reported that it feels a bit like the sense of touch, on the face. One report tells of a totally blind boy who could ride his tricycle at good speed round the block near his home, using facial vision. Experiments showed that, in fact, facial vision is nothing to do with touch or the front of the face, although the sensation may be referred to the front of the face, like the referred pain in a phantom limb. The sensation of facial vision, it turns out, really goes in through the ears. Blind people, without even being aware of the fact, are actually using echoes of their own footsteps and of other sounds, to sense the presence of obstacles. Before this was discovered, engineers had already built instruments to exploit the principle, for example to measure the depth of the sea under a ship. After this technique had been invented, it was only a matter of time before weapons designers adapted it for the detection of submarines. Both sides in the Second world war relied heavily on these devices, under such codenames as Asdic (British) and Sonar (American), as well as Radar (American) or RDF (British), which uses radio echoes rather than sound echoes.

E The Sonar and Radar pioneers didn't know it then, but all the world now knows that bats, or rather natural selection working on bats, had perfected the system tens of millions of years earlier, and their 'radar' achieves feats of detection and navigation that would strike an engineer dumb with admiration. It is technically incorrect to talk about bat 'radar', since they do not use radio waves. It is sonar. But the underlying mathematical theories of radar and sonar are very similar, and much of our scientific understanding of the details of what bats are doing has come from applying radar theory to them. The American zoologist Donald Griffin, who was largely responsible for the discovery of sonar in bats, coined the term 'echolocation' to cover both sonar and radar, whether used by animals or by human instruments.

#### Questions 1-5

Reading Passage 1 has five paragraphs, A-E.

Which paragraph contains the following information?

Write the correct letter, A-E, in boxes 1-5 on your answer sheet.

**NB** You may use any letter more than once.

- 1 examples of wildlife other than bats which do not rely on vision to navigate by
- 2 how early mammals avoided dying out
- 3 why bats hunt in the dark
- 4 how a particular discovery has helped our understanding of bats
- 5 early military uses of echolocation

Questions 6-9

Complete the summary below.

Choose **ONE WORD ONLY** from the passage for each answer.

Write your answers in boxes 6-9 on your answer sheet.

### Facial Vision

Blind people report that so-called 'facial vision' is comparable to the sensation of touch on the face. In fact, the sensation is more similar to the way in which pain from a 6..... arm or leg might be felt. The ability actually comes from perceiving 7..... through the ears. However, even before this was understood, the principle had been applied in the design of instruments which calculated the 8..... of the seabed. This was followed by a wartime application in devices for finding 9..... .

Questions 10-13

Complete the sentences below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Write your answers in boxes 10-13 on your answer sheet.

- 10 Long before the invention of radar, ..... had resulted in a sophisticated radar-like system in bats.
- 11 Radar is an inaccurate term when referring to bats because ..... are not used in their navigation system.
- 12 Radar and sonar are based on similar..... .



13 The word 'echolocation' was first used by someone working as a..... .

### 第三课 LOH 题 (List of Headings)

#### 第一篇

Questions 1 - 7

Reading passage 1 has seven paragraphs, **A - G**.

Choose the correct heading for each paragraph from the list of headings below.

Write the correct number, **i - x**, in boxes 1 - 7 on your answer sheet.

#### List of Headings

- i. Early years of Gilbert
- ii. What was new about his scientific research method
- iii. The development of chemistry
- iv. Questioning traditional astronomy
- v. Pioneers of the early science
- vi. Professional and social recognition
- vii. Becoming the president of the Royal Science Society
- viii. The great works of Gilbert
- ix. His discovery about magnetism
- x. His change of focus

- 1. Paragraph A
- 2. Paragraph B
- 3. Paragraph C
- 4. Paragraph D
- 5. Paragraph E
- 6. Paragraph F
- 7. Paragraph G

A. 16th and 17th centuries say two great pioneers of modern science: Galileo and Gilbert. The impact of their findings is eminent. Gilbert was the first modern scientist, also the accredited father of the science of electricity and magnetism, an Englishman of learning and a physician at the court of Elizabeth. Prior to him, all that was known of electricity and magnetism was what the ancients knew, nothing more than that the lodestone possessed magnetic properties and that amber and jet, when rubbed, would attract bits of paper or other substances of small specific gravity. However, he is less well-known than he deserves.

B. Gilbert's birth predated Galileo. Born in an eminent local family in Colchester county in the UK, on May 24, 1544, he went to grammar school, and then studied medicine at St. John's College, Cambridge, graduating in 1573. Later he traveled in continent and eventually settled down in London.

C. He was a very successful and eminent doctor. All this culminated in his election to the president of the Royal Science Society. He was also appointed the personal physician to the Queen (Elizabeth I), and later knighted by the Queen. He faithfully served her until her death. However, he didn't outlive the Queen for long and died on December 10, 1603, only a few months after his appointment as personal physician to King James.

D. Gilbert was first interested in chemistry but later changed his focus due to the large portion of mysticism of alchemy involved (such as the transmutation of metal). He gradually developed his interest in physics after the great minds of the ancient, particularly about the knowledge the ancient Greeks had about lodestones, strange minerals with the power to attract iron. In the meantime, Britain became a major seafaring nation in 1588 when the Spanish Armada was defeated, opening the way to British settlement of America. British ships depended on the magnetic compass, yet no one understood why it worked. Did the pole star attract it, as Columbus once speculated ; or was there a magnetic mountain at the pole, as described in Odyssey , which ships would never approach, because the sailors thought its pull would yank out all their iron nails and fittings? For nearly 20 years William Gilbert conducted ingenious experiments to understand magnetism. His works include On the Magnet and Magnetic Bodies, Great Magnet of the Earth.

E. Gilbert's discovery was so important to modern physics. He investigated the nature of magnetism and electricity. He even coined the word 'electric'. Though the early beliefs of magnetism were also largely entangled with superstitions such as that rubbing garlic on lodestone can neutralize its magnetism, one example being that

sailors even believed the smell of garlic would even interfere with the action of compass, which is why helmsmen were forbidden to eat it near a ship's compass. Gilbert also found that metals can be magnetized by rubbing materials such as fur, plastic or the like on them. He named the ends of a magnet 'north pole' and 'south pole'. The magnetic poles can attract or repel, depending on polarity. In addition, however, ordinary iron is always attracted to a magnet. Though he started to study the relationship between magnetism and electricity, sadly he didn't complete it. His research of static electricity using amber and jet only demonstrated that objects with electrical charges can work like magnets attracting small pieces of paper and stuff. It is a French guy named du Fay that discovered that there are actually two electrical charges, positive and negative.

F. He also questioned the traditional astronomical beliefs. Though a Copernican, he didn't express in his quintessential beliefs whether the earth is at the center of the universe or in orbit around the sun. However he believed that stars are not equidistant from the earth, but have their own earth-like planets orbiting around them. The earth is itself like a giant magnet, which is also why compasses always point north. They spin on an axis that is aligned with the earth's polarity. He even likened the polarity of the magnet to the polarity of the earth and built an entire magnetic philosophy on this analogy. In his explanation, magnetism was the soul of the earth. Thus a perfectly spherical lodestone, when aligned with the earth's poles, would wobble all by itself in 24 hours. Further, he also believed that suns and other stars wobble just like the earth does around a crystal core, and speculated that the moon might also be a magnet caused to orbit by its magnetic attraction to the earth. This was perhaps the first proposal that a force might cause a heavenly orbit.

G. His research method was revolutionary in that he used experiments rather than pure logic and reasoning like the ancient Greek philosophers did. It was a new attitude toward scientific investigation. Until then, scientific experiments were not in fashion. It was because of this scientific attitude, together with his contribution to our knowledge of magnetism, that a unit of magnetomotive force, also known as magnetic potential, was named Gilbert in his honor. His approach of careful observation and experimentation rather than the authoritative opinion or deductive philosophy of others had laid the every foundation for modern science.

## 第二篇

*Reading Passage 1 has five marked paragraphs, A-E.*

*Choose the correct heading for each paragraph from the list of headings below.*

Write the correct number, i-viii, in boxes 1-5 on your answer sheet.

**List of Headings**

- i Avoiding an overcrowded centre
- ii A successful exercise in people power
- iii The benefits of working together in cities
- iv Higher incomes need not mean more cars
- v Economic arguments fail to persuade
- vi The impact of telecommunications on population distribution
- vii Increases in travelling time
- viii Responding to arguments against public transport

- 1 Paragraph A
- 2 Paragraph B
- 3 Paragraph C
- 4 Paragraph D
- 5 Paragraph E

**Advantages of public transport**

A new study conducted for the World Bank by Murdoch University's Institute for Science and Technology Policy (ISTP) has demonstrated that public transport is more efficient than cars. The study compared the proportion of wealth poured into transport by thirty-seven cities around the world. This included both the public and private costs of building, maintaining and using a transport system.

The study found that the Western Australian city of Perth is a good example of a city with minimal public transport. As a result, 17% of its wealth went into transport costs. Some European and Asian cities, on the other hand, spent as little as 5%. Professor Peter Newman, ISTP Director, pointed out that these more efficient cities were able to put the difference into attracting industry and jobs or creating a better place to live.

Newman says this is a new, broader way of considering public transport issues. In the past, the case for public transport has been made on the basis of environmental and social justice considerations rather than economics. Newman, however, believes the study demonstrates that 'the auto-dependent city model is inefficient and grossly inadequate in economic as well as environmental terms'.

Bicycle use was not included in the study but Newman noted that the two most 'bicycle friendly' cities

considered - Amsterdam and Copenhagen - were very efficient, even though their public transport systems were 'reasonable but not special'.

**A** In fact, Newman believes the main reason for adopting one sort of transport over another is politics: 'The more democratic the process, the more public transport is favored.' He considers Portland, Oregon, a perfect example of this. Some years ago, federal money was granted to build a new road. However, local pressure groups forced a referendum over whether to spend the money on light rail instead. The rail proposal won and the railway worked spectacularly well. In the years that have followed, more and more rail systems have been put in, dramatically changing the nature of the city.

**B** In the UK, travel times to work had been stable for at least six centuries, with people avoiding situations that required them to spend more than half an hour travelling to work. Trains and cars initially allowed people to live at greater distances without taking longer to reach their destination. However, public infrastructure did not keep pace with urban sprawl, causing massive congestion problems which now make commuting times far higher.

**C** There is a widespread belief that increasing wealth encourages people to live farther out where cars are the only viable transport. The example of European cities refutes that. They are often wealthier than their American counterparts but have not generated the same level of car use. In Stockholm, car use has actually fallen in recent years as the city has become larger and wealthier. A new study makes this point even more starkly. Developing cities in Asia, such as Jakarta and Bangkok, make more use of the car than wealthy Asian cities such as Tokyo and Singapore. In cities that developed later, the World Bank and Asian Development Bank discouraged the building of public transport and people have been forced to rely on cars -creating the massive traffic jams that characterize those cities.

**D** Newman believes one of the best studies on how cities built for cars might be converted to rail use is The Urban Village report, which used Melbourne as an example. It found that pushing everyone into the city centre was not the best approach. Instead, the proposal advocated the creation of urban villages at hundreds of sites, mostly around railway stations.

**E** It was once assumed that improvements in telecommunications would lead to more dispersal in the population as people were no longer forced into cities. However, the ISTP team's research demonstrates that the population and job density of cities rose or remained constant in the 1980s after decades of decline. The explanation for this seems to be that it is valuable to place people working in related fields together. 'The new world will largely depend on human creativity, and creativity flourishes where people come together face-to-face.'

第三篇

Reading Passage 1 has six sections, **A-F**.

Choose the correct heading for sections **B-F** from the list of headings below.

Write the correct number, i-ix, in boxes 1-5 on your answer sheet.

**List of Headings**

- i The influence of Monbusho
- ii Helping less successful students
- iii The success of compulsory education
- iv Research findings concerning achievements in maths
- v The typical format of a maths lesson
- vi Comparative expenditure on maths education
- vii Background to middle-years education in Japan
- viii The key to Japanese successes in maths education
- ix The role of homework correction

Example	Answer
Section A	iv

- 1 Section B
- 2 Section C
- 3 Section D
- 4 Section E
- 5 Section F

**LAND OF THE RISING SUM**

A Japan has a significantly better record in terms of average mathematical attainment than England and Wales. Large sample international comparisons of pupils' attainments since the 1960s have established that not only did Japanese pupils at age 13 have better scores of average attainment, but there was also a larger proportion of 'low' attainers in England, where, incidentally, the variation in attainment scores was much



greater. The percentage of Gross National Product spent on education is reasonably similar in the two countries, so how is this higher and more consistent attainment in maths achieved?

B Lower secondary schools in Japan cover three school years, from the seventh grade (age 13) to the ninth grade (age 15). Virtually all pupils at this stage attend state schools: only 3 per cent are in the private sector. Schools are usually modern in design, set well back from the road and spacious inside. Classrooms are large and pupils sit at single desks in rows. Lessons last for a standardised 50 minutes and are always followed by a 10-minute break, which gives the pupils a chance to let off steam. Teachers begin with a formal address and mutual bowing, and then concentrate on whole-class teaching.

Classes are large - usually about 40 - and are unstreamed. Pupils stay in the same class for all lessons throughout the school and develop considerable class identity and loyalty. Pupils attend the school in their own neighbourhood, which in theory removes ranking by school. In practice in Tokyo, because of the relative concentration of schools, there is some competition to get into the 'better' school in a particular area.

C Traditional ways of teaching form the basis of the lesson and the remarkably quiet classes take their own notes of the points made and the examples demonstrated. Everyone has their own copy of the textbook supplied by the central education authority, Monbusho, as part of the concept of free compulsory education up to the age of 15. These textbooks are, on the whole, small, presumably inexpensive to produce, but well set out and logically developed. (One teacher was particularly keen to introduce colour and pictures into maths textbooks: he felt this would make them more accessible to pupils brought up in a cartoon culture. ) Besides approving textbooks, Monbusho also decides the highly centralised national curriculum and how it is to be delivered.

D Lessons all follow the same pattern. At the beginning, the pupils put solutions to the homework on the board, then the teachers comment, correct or elaborate as necessary. Pupils mark their own homework: this is an important principle in Japanese schooling as it enables pupils to see where and why they made a mistake, so that these can be avoided in future. No one minds mistakes or ignorance as long as you are prepared to learn from them. After the homework has been discussed, the teacher explains the topic of the lesson, slowly and with a lot of repetition and elaboration. Examples are demonstrated on the board; questions from the textbook are worked through first with the class, and then the class is set questions from the textbook to do individually. Only rarely are supplementary worksheets distributed in a maths class. The impression is that the logical nature of the textbooks and their comprehensive coverage of different types of examples, combined with the relative homogeneity of the class, renders work sheets unnecessary. At this point, the teacher would circulate and make sure that all the pupils were coping well.

E It is remarkable that large, mixed-ability classes could be kept together for maths throughout all their compulsory schooling from 6 to 15. Teachers say that they give individual help at the end of a lesson or after school, setting extra work if necessary. In observed lessons, any strugglers would be assisted by the teacher or quietly seek help from their neighbour. Carefully fostered class identity makes pupils keen to help each other - anyway, it is in their interests since the class progresses together.

This scarcely seems adequate help to enable slow learners to keep up. However, the Japanese attitude towards education runs along the lines of 'if you work hard enough, you can do almost anything'. Parents are kept closely informed of their children's progress and will play a part in helping their children to keep up with class, sending them to 'Juku' (private evening tuition) if extra help is needed and encouraging them to work harder. It seems to work, at least for 95 per cent of the school population.

F So what are the major contributing factors in the success of maths teaching? Clearly, attitudes are important. Education is valued greatly in Japanese culture; maths is recognised as an important compulsory subject throughout schooling; and the emphasis is on hard work coupled with a focus on accuracy.

Other relevant points relate to the supportive attitude of a class towards slower pupils, the lack of competition within a class, and the positive emphasis on learning for oneself and improving one's own standard. And the view of repetitively boring lessons and learning the facts by heart, which is sometimes quoted in relation to Japanese classes, may be unfair and unjustified. No poor maths lessons were observed. They were mainly good and one or two were inspirational.

#### 第四课 判断题

##### 第一篇

### The Truth about the Environment

For many environmentalists, the world seems to be getting worse. They have developed a hit-list of our main fears: that natural resources are running out; that the population is ever growing, leaving less and less to eat; that species are becoming extinct in vast numbers, and that the planet's air and water are becoming ever more polluted.

But a quick look at the facts shows a different picture. First, energy and other natural resources have become more abundant, not less so, since the book 'The Limits to Growth' was published in 1972 by a group of scientists. Second, more food is now produced per head of the world's population than at any time in history. Fewer people are starving. Third, although species are indeed becoming extinct, only about 0.7% of them are expected to

disappear in the next 50 years, not 25-50%, as has so often been predicted. And finally, most forms of environmental pollution either appear to have been exaggerated, or are transient - associated with the early phases of industrialisation and therefore best cured not by restricting economic growth, but by accelerating it. One form of pollution - the release of greenhouse gases that causes global warming - does appear to be a phenomenon that is going to extend well into our future, but its total impact is unlikely to pose a devastating problem. A bigger problem may well turn out to be an inappropriate response to it.

Yet opinion polls suggest that many people nurture the belief that environmental standards are declining and four factors seem to cause this disjunction between perception and reality.

One is the lopsidedness built into scientific research. Scientific funding goes mainly to areas with many problems. That may be wise policy, but it will also create an impression that many more potential problems exist than is the case.

Secondly, environmental groups need to be noticed by the mass media. They also need to keep the money rolling in. Understandably, perhaps, they sometimes overstate their arguments. In 1997, for example, the World Wide Fund for Nature issued a press release entitled: 'Two thirds of the world's forests lost forever'. The truth turns out to be nearer 20%.

Though these groups are run overwhelmingly by selfless folk, they nevertheless share many of the characteristics of other lobby groups. That would matter less if people applied the same degree of scepticism to environmental lobbying as they do to lobby groups in other fields. A trade organisation arguing for, say, weaker pollution controls is instantly seen as self-interested. Yet a green organisation opposing such a weakening is seen as altruistic, even if an impartial view of the controls in question might suggest they are doing more harm than good.

A third source of confusion is the attitude of the media. People are clearly more curious about bad news than good. Newspapers and broadcasters are there to provide what the public wants. That, however, can lead to significant distortions of perception. An example was America's encounter with El Niño in 1997 and 1998. This climatic phenomenon was accused of wrecking tourism, causing allergies, melting the ski-slopes and causing 22 deaths. However, according to an article in the Bulletin of the American Meteorological Society, the damage it did was estimated at US \$4 billion but the benefits amounted to some US \$19 billion. These came from higher winter temperatures (which saved an estimated 850 lives, reduced heating costs and diminished spring floods caused by meltwaters).

The fourth factor is poor individual perception. People worry that the endless rise in the amount of stuff everyone throws away will cause the world to run out of places to dispose of waste. Yet, even if America's trash

output continues to rise as it has done in the past, and even if the American population doubles by 2100, all the rubbish America produces through the entire 21st century will still take up only one-12,000th of the area of the entire United States.

Questions 27-32

Do the following statements agree with the claims of the writer in Reading Passage 3?

In boxes 27-32 on your answer sheet, write

- YES** if the statement agrees with the writer's claims  
**NO** if the statement contradicts the writer's claims  
**NOT GIVEN** if it is impossible to say what the writer thinks about this

- 27 Environmentalists take a pessimistic view of the world for a number of reasons.  
 28 Data on the Earth's natural resources has only been collected since 1972.  
 29 The number of starving people in the world has increased in recent years.  
 30 Extinct species are being replaced by new species.  
 31 Some pollution problems have been correctly linked to industrialisation.  
 32 It would be best to attempt to slow down economic growth.

第二篇

Numeration

One of the first great intellectual feats of a young child is learning how to talk, closely followed by learning how to count. From earliest childhood we are so bound up with our system of numeration that it is a feat of imagination to consider the problems faced by early humans who had not yet developed this facility. Careful consideration of our system of numeration leads to the conviction that, rather than being a facility that comes naturally to a person, it is one of the great and remarkable achievements of the human race.

It is impossible to learn the sequence of events that led to our developing the concept of number. Even the earliest of tribes had a system of numeration that, if not advanced, was sufficient for the tasks that they had to perform. Our ancestors had little use for actual numbers; instead their considerations would have been more of the kind Is this enough? rather than How many? when they were engaged in food gathering, for example. However, when early humans first began to reflect on the nature of things around them, they discovered that

they needed an idea of number simply to keep their thoughts in order. As they began to settle, grow plants and herd animals, the need for a sophisticated number system became paramount. It will never be known how and when this numeration ability developed, but it is certain that numeration was well developed by the time humans had formed even semi-permanent settlements.

Evidence of early stages of arithmetic and numeration can be readily found. The indigenous peoples of Tasmania were only able to count one, two, many; those of South Africa counted one, two, two and one, two twos, two twos and one, and so on. But in real situations the number and words are often accompanied by gestures to help resolve any confusion. For example, when using the one, two, many type of system, the word many would mean, Look at my hands and see how many fingers I am showing you. This basic approach is limited in the range of numbers that it can express, but this range will generally suffice when dealing with the simpler aspects of human existence.

The lack of ability of some cultures to deal with large numbers is not really surprising. European languages, when traced back to their earlier version, are very poor in number words and expressions. The ancient Gothic word for ten, tachund, is used to express the number 100 as tachund tachund. By the seventh century, the word teon had become interchangeable with the tachund or hund of the Anglo-Saxon language, and so 100 was denoted as hund teontig, or ten times ten. The average person in the seventh century in Europe was not as familiar with numbers as we are today. In fact, to qualify as a witness in a court of law a man had to be able to count to nine! Perhaps the most fundamental step in developing a sense of number is not the ability to count, but rather to see that a number is really an abstract idea instead of a simple attachment to a group of particular objects. It must have been within the grasp of the earliest humans to conceive that four birds are distinct from two birds; however, it is not an elementary step to associate the number 4, as connected with four birds, to the number 4, as connected with four rocks. Associating a number as one of the qualities of a specific object is a great hindrance to the development of a true number sense. When the number 4 can be registered in the mind as a specific word, independent of the object being referenced, the individual is ready to take the first step toward the development of a notational system for numbers and, from there, to arithmetic.

Traces of the very first stages in the development of numeration can be seen in several living languages today. The numeration system of the Tsimshian language in British Columbia contains seven distinct sets of words for numbers according to the class of the item being counted: for counting flat objects and animals, for round objects and time, for people, for long objects and trees, for canoes, for measures, and for counting when no particular object is being numerated. It seems that the last is a later development while the first six groups show the relics of an older system. This diversity of number names can also be found in some widely used languages such as

Japanese.

Intermixed with the development of a number sense is the development of an ability to count. Counting is not directly related to the formation of a number concept because it is possible to count by matching the items being counted against a group of pebbles, grains of corn, or the counter's fingers. These aids would have been indispensable to very early people who would have found the process impossible without some form of mechanical aid. Such aids, while different, are still used even by the most educated in today's society due to their convenience. All counting ultimately involves reference to something other than the things being counted. At first it may have been grains or pebbles but now it is a memorised sequence of words that happen to be the names of the numbers.

#### Questions 32-40

Do the following statements agree with the information given in Reading Passage 3?

In boxes 32-40 on your answer sheet, write

**TRUE** if the statement agrees with the information

**FALSE** if the statement contradicts the information

**NOT GIVEN** if there is no information on this

- 32 For the earliest tribes, the concept of sufficiency was more important than the concept of quantity.
- 33 Indigenous Tasmanians used only four terms to indicate numbers of objects.
- 34 Some peoples with simple number systems use body language to prevent misunderstanding of expressions of number.
- 35 All cultures have been able to express large numbers clearly.
- 36 The word 'thousand' has Anglo-Saxon origins.
- 37 In general, people in seventh-century Europe had poor counting ability.
- 38 In the Tsimshian language, the number for long objects and canoes is expressed with the same word.
- 39 The Tsimshian language contains both older and newer systems of counting.
- 40 Early peoples found it easier to count by using their fingers rather than a group of pebbles.

第三篇



A The history of human civilisation is entwined with the history of the ways we have learned to manipulate water resources. As towns gradually expanded, water was brought from increasingly remote sources, leading to sophisticated engineering efforts such as dams and aqueducts. At the height of the Roman Empire, nine major systems, with an innovative layout of pipes and well-built sewers, supplied the occupants of Rome with as much water per person as is provided in many parts of the industrial world today.

B During the industrial revolution and population explosion of the 19th and 20th centuries, the demand for water rose dramatically. Unprecedented construction of tens of thousands of monumental engineering projects designed to control floods, protect clean water supplies, and provide water for irrigation and hydropower brought great benefits to hundreds of millions of people. Food production has kept pace with soaring populations mainly because of the expansion of artificial irrigation systems that make possible the growth of 40 % of the world's food. Nearly one fifth of all the electricity generated worldwide is produced by turbines spun by the power of falling water.

C Yet there is a dark side to this picture: despite our progress, half of the world's population still suffers, with water services inferior to those available to the ancient Greeks and Romans. As the United Nations report on access to water reiterated in November 2001, more than one billion people lack access to clean drinking water some two and a half billion do not have adequate sanitation services. Preventable water-related diseases kill an estimated 10,000 to 20,000 children every day, and the latest evidence suggests that we are falling behind in efforts to solve these problems.

D The consequences of our water policies extend beyond jeopardising human health. Tens of millions of people have been forced to move from their homes - often with little warning or compensation - to make way for the reservoirs behind dams. More than 20 % of all freshwater fish species are now threatened or endangered because dams and water withdrawals have destroyed the free-flowing river ecosystems where they thrive. Certain irrigation practices degrade soil quality and reduce agricultural productivity. Groundwater aquifers\* are being pumped down faster than they are naturally replenished in parts of India, China, the USA and elsewhere. And disputes over shared water resources have led to violence and continue to raise local, national and even international tensions.

\* underground stores of water

E At the outset of the new millennium, however, the way resource planners think about water is beginning to change. The focus is slowly shifting back to the provision of basic human and environmental needs as top priority - ensuring 'some for all,' instead of 'more for some'. Some water experts are now demanding that existing infrastructure be used in smarter ways rather than building new facilities, which is increasingly considered the

option of last, not first, resort. This shift in philosophy has not been universally accepted, and it comes with strong opposition from some established water organisations. Nevertheless, it may be the only way to address successfully the pressing problems of providing everyone with clean water to drink, adequate water to grow food and a life free from preventable water-related illness.

F Fortunately - and unexpectedly - the demand for water is not rising as rapidly as some predicted. As a result, the pressure to build new water infrastructures has diminished over the past two decades. Although population, industrial output and economic productivity have continued to soar in developed nations, the rate at which people withdraw water from aquifers, rivers and lakes has slowed. And in a few parts of the world, demand has actually fallen.

G What explains this remarkable turn of events? Two factors: people have figured out how to use water more efficiently, and communities are rethinking their priorities for water use. Throughout the first three-quarters of the 20th century, the quantity of freshwater consumed per person doubled on average; in the USA, water withdrawals increased tenfold while the population quadrupled. But since 1980, the amount of water consumed per person has actually decreased, thanks to a range of new technologies that help to conserve water in homes and industry. In 1965, for instance, Japan used approximately 13 million gallons\* of water to produce \$1 million of commercial output; by 1989 this had dropped to 3.5 million gallons (even accounting for inflation) - almost a quadrupling of water productivity. In the USA, water withdrawals have fallen by more than 20 % from their peak in 1980.

H On the other hand, dams, aqueducts and other kinds of infrastructure will still have to be built, particularly in developing countries where basic human needs have not been met. But such projects must be built to higher specifications and with more accountability to local people and their environment than in the past. And even in regions where new projects seem warranted, we must find ways to meet demands with fewer resources, respecting ecological criteria and to a smaller budget.

#### Questions 21-26

Do the following statements agree with the information given in Reading Passage 2?

In boxes 21-26 on your answer sheet, write

- |                  |   |
|------------------|---|
| <b>YES</b>       | <i>if the statement agrees with the claims of the writer</i>        |
| <b>NO</b>        | <i>if the statement contradicts the claims of the writer</i>        |
| <b>NOT GIVEN</b> | <i>if it is impossible to say what the writer thinks about this</i> |

- 21 Water use per person is higher in the industrial world than it was in Ancient Rome.
- 22 Feeding increasing populations is possible due primarily to improved irrigation systems.
- 23 Modern water systems imitate those of the ancient Greeks and Romans.
- 24 Industrial growth is increasing the overall demand for water.
- 25 Modern technologies have led to a reduction in domestic water consumption.
- 26 In the future, governments should maintain ownership of water infrastructures.

## 第五课 选择题和简答题

### 选择题第一题

## LAND OF THE RISING SUM

A Japan has a significantly better record in terms of average mathematical attainment than England and Wales. Large sample international comparisons of pupils' attainments since the 1960s have established that not only did Japanese pupils at age 13 have better scores of average attainment, but there was also a larger proportion of 'low' attainers in England, where, incidentally, the variation in attainment scores was much greater. The percentage of Gross National Product spent on education is reasonably similar in the two countries, so how is this higher and more consistent attainment in maths achieved?

B Lower secondary schools in Japan cover three school years, from the seventh grade (age 13) to the ninth grade (age 15). Virtually all pupils at this stage attend state schools: only 3 per cent are in the private sector. Schools are usually modern in design, set well back from the road and spacious inside. Classrooms are large and pupils sit at single desks in rows. Lessons last for a standardised 50 minutes and are always followed by a 10-minute break, which gives the pupils a chance to let off steam. Teachers begin with a formal address and mutual bowing, and then concentrate on whole-class teaching.

Classes are large - usually about 40 - and are unstreamed. Pupils stay in the same class for all lessons throughout the school and develop considerable class identity and loyalty. Pupils attend the school in their own neighbourhood, which in theory removes ranking by school. In practice in Tokyo, because of the relative concentration of schools, there is some competition to get into the 'better' school in a particular area.

C Traditional ways of teaching form the basis of the lesson and the remarkably quiet classes take their own notes of the points made and the examples demonstrated. Everyone has their own copy of the textbook supplied by the central education authority, Monbusho, as part of the concept of free compulsory education up

to the age of 15. These textbooks are, on the whole, small, presumably inexpensive to produce, but well set out and logically developed. (One teacher was particularly keen to introduce colour and pictures into maths textbooks: he felt this would make them more accessible to pupils brought up in a cartoon culture. ) Besides approving textbooks, Monbusho also decides the highly centralised national curriculum and how it is to be delivered.

D Lessons all follow the same pattern. At the beginning, the pupils put solutions to the homework on the board, then the teachers comment, correct or elaborate as necessary. Pupils mark their own homework: this is an important principle in Japanese schooling as it enables pupils to see where and why they made a mistake, so that these can be avoided in future. No one minds mistakes or ignorance as long as you are prepared to learn from them. After the homework has been discussed, the teacher explains the topic of the lesson, slowly and with a lot of repetition and elaboration. Examples are demonstrated on the board; questions from the textbook are worked through first with the class, and then the class is set questions from the textbook to do individually. Only rarely are supplementary worksheets distributed in a maths class. The impression is that the logical nature of the textbooks and their comprehensive coverage of different types of examples, combined with the relative homogeneity of the class, renders work sheets unnecessary. At this point, the teacher would circulate and make sure that all the pupils were coping well.

E It is remarkable that large, mixed-ability classes could be kept together for maths throughout all their compulsory schooling from 6 to 15. Teachers say that they give individual help at the end of a lesson or after school, setting extra work if necessary. In observed lessons, any strugglers would be assisted by the teacher or quietly seek help from their neighbour. Carefully fostered class identity makes pupils keen to help each other - anyway, it is in their interests since the class progresses together.

This scarcely seems adequate help to enable slow learners to keep up. However, the Japanese attitude towards education runs along the lines of 'if you work hard enough, you can do almost anything'. Parents are kept closely informed of their children's progress and will play a part in helping their children to keep up with class, sending them to 'Juku' (private evening tuition) if extra help is needed and encouraging them to work harder. It seems to work, at least for 95 per cent of the school population.

F So what are the major contributing factors in the success of maths teaching? Clearly, attitudes are important. Education is valued greatly in Japanese culture; maths is recognised as an important compulsory subject throughout schooling; and the emphasis is on hard work coupled with a focus on accuracy.

Other relevant points relate to the supportive attitude of a class towards slower pupils, the lack of competition within a class, and the positive emphasis on learning for oneself and improving one's own

standard. And the view of repetitively boring lessons and learning the facts by heart, which is sometimes quoted in relation to Japanese classes, may be unfair and unjustified. No poor maths lessons were observed. They were mainly good and one or two were inspirational.

Questions 10-13

Choose the correct letter, A, B, C or D.

Write the correct letter in boxes 10-13 on your answer sheet.

10 Maths textbooks in Japanese schools are

- A cheap for pupils to buy.
- B well organised and adapted to the needs of the pupils.
- C written to be used in conjunction with TV programmes.
- D not very popular with many Japanese teachers.

11 When a new maths topic is introduced,

- A students answer questions on the board.
- B students rely entirely on the textbook.
- C it is carefully and patiently explained to the students.
- D it is usual for students to use extra worksheets.

12 How do schools deal with students who experience difficulties?

- A They are given appropriate supplementary tuition.
- B They are encouraged to copy from other pupils.
- C They are forced to explain their slow progress.
- D They are placed in a mixed-ability class.

13 Why do Japanese students tend to achieve relatively high rates of success in maths?

- A It is a compulsory subject in Japan.
- B They are used to working without help from others.
- C Much effort is made and correct answers are emphasised.
- D There is a strong emphasis on repetitive learning.

选择题第二题

## Biological control of pests

The continuous and reckless use of synthetic chemicals for the control of pests which pose a threat to agricultural crops and human health is proving to be counter-productive. Apart from engendering widespread ecological disorders, pesticides have contributed to the emergence of a new breed of chemical-resistant, highly lethal superbugs.

According to a recent study by the Food and Agriculture Organisation (FAO), more than 300 species of agricultural pests have developed resistance to a wide range of potent chemicals. Not to be left behind are the disease-spreading pests, about 100 species of which have become immune to a variety of insecticides now in use.

One glaring disadvantage of pesticides' application is that, while destroying harmful pests, they also wipe out many useful non-targeted organisms, which keep the growth of the pest population in check. This results in what agroecologists call the 'treadmill syndrome'. Because of their tremendous breeding potential and genetic diversity, many pests are known to withstand synthetic chemicals and bear offspring with a built-in resistance to pesticides.

The havoc that the 'treadmill syndrome' can bring about is well illustrated by what happened to cotton farmers in Central America. In the early 1940s, basking in the glory of chemical-based intensive agriculture, the farmers avidly took to pesticides as a sure measure to boost crop yield. The insecticide was applied eight times a year in the mid-1940s, rising to 28 in a season in the mid-1950s, following the sudden proliferation of three new varieties of chemical-resistant pests.

By the mid-1960s, the situation took an alarming turn with the outbreak of four more new pests, necessitating pesticide spraying to such an extent that 50% of the financial outlay on cotton production was accounted for by pesticides. In the early 1970s, the spraying frequently reached 70 times a season as the farmers were pushed to the wall by the invasion of genetically stronger insect species.

Most of the pesticides in the market today remain inadequately tested for properties that cause cancer and mutations as well as for other adverse effects on health, says a study by United States environmental agencies. The United States National Resource Defense Council has found that DDT was the most popular of a long list of dangerous chemicals in use.



In the face of the escalating perils from indiscriminate applications of pesticides, a more effective and ecologically sound strategy of biological control, involving the selective use of natural enemies of the pest population, is fast gaining popularity- though, as yet, it is a new field with limited potential. The advantage of biological control in contrast to other methods is that it provides a relatively low-cost, perpetual control system with a minimum of detrimental side-effects. When handled by experts, bio-control is safe, non-polluting and self-dispersing.

The Commonwealth Institute of Biological Control (CIBC) in Bangalore, with its global network of research laboratories and field stations, is one of the most active, non-commercial research agencies engaged in pest control by setting natural predators against parasites. CIBC also serves as a clearing-house for the export and import of biological agents for pest control world-wide.

CIBC successfully used a seed-feeding weevil, native to Mexico, to control the obnoxious parthenium weed, known to exert devious influence on agriculture and human health in both India and Australia. Similarly the Hyderabad-based Regional Research Laboratory (RRL), supported by CIBC, is now trying out an Argentinian weevil for the eradication of water hyacinth, another dangerous weed, which has become a nuisance in many parts of the world. According to Mrs Kaiser Jamil of RRL, 'The Argentinian weevil does not attack any other plant and a pair of adult bugs could destroy the weed in 4-5 days.' CIBC is also perfecting the technique for breeding parasites that prey on 'disapene scale' insects - notorious defoliants of fruit trees in the US and India.

How effectively biological control can be pressed into service is proved by the following examples. In the late 1960s, when Sri Lanka's flourishing coconut groves were plagued by leaf-mining hispid, a larval parasite imported from Singapore brought the pest under control. A natural predator indigenous to India, *Neodumetia sangawani*, was found useful in controlling the Rhodes grass-scale insect that was devouring forage grass in many parts of the US. By using *Neochetina bruci*, a beetle native to Brazil, scientists at Kerala Agricultural University freed a 12-kilometre-long canal from the clutches of the weed *Salvinia molesta*, popularly called 'African Payal' in Kerala. About 30, 000 hectares of rice fields in Kerala are infested by this weed.

#### Questions 14-17

Choose the correct letter, A, B, C, or D.

Write the correct letter in boxes 14-17 on your answer sheet.

14 The use of pesticides has contributed to

A a change in the way ecologies are classified by agroecologists.

- B an imbalance in many ecologies around the world.
- C the prevention of ecological disasters in some parts of the world.
- D an increase in the range of ecologies which can be usefully farmed.
- 15 The Food and Agriculture Organisation has counted more than 300 agricultural pests which
- A are no longer responding to most pesticides in use.
- B can be easily controlled through the use of pesticides.
- C continue to spread disease in a wide range of crops.
- D may be used as part of bio-control's replacement of pesticides.
- 16 Cotton farmers in Central America began to use pesticides
- A because of an intensive government advertising campaign.
- B in response to the appearance of new varieties of pest.
- C as a result of changes in the seasons and the climate.
- D to ensure more cotton was harvested from each crop.
- 17 By the mid-1960s, cotton farmers in Central America found that pesticides
- A were wiping out 50% of the pests plaguing the crops.
- B were destroying 50% of the crops they were meant to protect.
- C were causing a 50% increase in the number of new pests reported.
- D were costing 50% of the total amount they spent on their crops.

简答题

### William Henry Perkin

#### The man who invented synthetic dyes

William Henry Perkin was born on March 12, 1838, in London, England. As a boy, Perkin's curiosity prompted early interests in the arts, sciences, photography, and engineering. But it was a chance stumbling upon a run-down, yet functional, laboratory in his late grandfather's home that solidified the young man's enthusiasm for chemistry.

As a student at the city of London School, Perkin became immersed in the study at chemistry. His talent

and devotion to the subject were perceived by his teachers, Thomas Hall, who encouraged him to attend a series of lectures given by the eminent scientist Michael Faraday at the Royal Institution. Those speeches fired the young chemistry's enthusiasm further, and he later went on to attend the Royal College of Chemistry, which he succeeded in entering in 1853, at the age of 15.

At the time of Perkin's enrolment, the Royal College of Chemistry was headed by the noted German chemist August Wilhelm Hofmann. Perkin's scientific gifts soon caught Hofmann's attention and, within two years, he became Hofmann's youngest assistant. Not long after that, Perkin made the scientific breakthrough that would bring him both fame and fortune.

At the time, quinine was the only viable medical treatment for malaria. The drug is derived from the bark of the cinchona tree, native to South America, and by 1856, demand for the drug was surpassing the available supply. Thus, when Hofmann made some passing comments about the desirability of a synthetic substitute for quinine, it was unsurprising that his star pupil was moved to take up the challenge.

During his vacation in 1856, Perkin spent his time in the laboratory on the top floor of his family's house. He was attempting to manufacture quinine from aniline, an inexpensive and readily available coal tar waste product. Despite his best efforts, however, he did not end up with quinine. Instead, he produced a mysterious dark sludge. Luckily, Perkin's scientific training and nature prompted him to investigate the substance further. Incorporating potassium dichromate and alcohol into the aniline at various stages of the experimental process, he finally produced a deep purple solution. And, proving the truth of the famous scientist Louis Pasteur's words 'chance favours only the prepared mind', Perkin saw the potential of his unexpected find.

Historically, textile dyes were made from such natural sources as plants and animal excretions. Some of these, such as the glandular mucus of snails, were difficult to obtain and outrageously expensive. Indeed, the purple colour extracted from a snail was once so costly that in society at the time only the rich could afford it. Further, natural dyes tend to be muddy in hue and fade quickly. It was against this backdrop that Perkin's discovery was made.

Perkin quickly grasped that his purple solution could be used to colour fabric, thus making it the world's first synthetic dye. Realising the importance of this breakthrough, he lost no time in patenting it. But perhaps the most fascinating of all Perkin's reactions to his find was his nearly instant recognition that the new dye had commercial possibilities.

Perkin originally named his dye Tyrian Purple, but it later became commonly known as mauve (from the French for the plant used to make the colour violet). He asked advice of Scottish dye works owner Robert Pullar, who assured him that manufacturing the dye would be well worth it if the colour remained fast (i.e. would not

fade) and the cost was relatively low. So, over the fierce objections of his mentor Hofmann, he left college to give birth to the modern chemical industry.

With the help of his father and brother, Perkin set up a factory not far from London. Utilising the cheap and plentiful coal tar that was an almost unlimited byproduct of London's gas street lighting, the dye works began producing the world's first synthetically dyed material in 1857. The company received a commercial boost from the Empress Eugenie of France, when she decided the new colour flattered her. Very soon, Mauve was the necessary shade for all the fashionable ladies in that country. Not to be outdone, England's Queen Victoria also appeared in public wearing a mauve gown, thus making it all the rage in England as well. The dye was bold and fast, and the public clamoured for more. Perkin went back to the drawing board.

Although Perkin's fame was achieved and fortune assured by his first discovery, the chemist continued his research. Among other dyes he developed and introduced were aniline red (1859) and aniline black (1863) and, in the late 1860s, Perkin's synthetic dye discoveries had outcomes far beyond the merely decorative. The dyes also became vital to medical research in many ways. For instance, they were used to stain previously invisible microbes and bacteria, allowing researchers to identify such bacilli as tuberculosis, cholera, and anthrax. Artificial dyes continue to play a crucial role today. And, in what would have been particularly pleasing to Perkin, their current use is in the search for a vaccine against malaria.

#### Questions 8-13

Answer the questions below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Write your answers in boxes 8—13 on your answer sheet.

- 8 Before Perkin's discovery, with what group in society was the colour purple associated?
- 9 What potential did Perkin immediately understand that his new dye had?
- 10 What was the name finally used to refer to the first colour Perkin invented?
- 11 What was the name of the person Perkin consulted before setting up his own dye works?
- 12 In what country did Perkin's newly invented colour first become fashionable?
- 13 According to the passage, which disease is now being targeted by researchers using synthetic dyes?