گروه زبان دکتر برزآبادی

New PRE-TOEFL Course

Reading Pamphlet

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Contents:

The first section of the TOEFL® iBT tests your ability to read and answer questions about passages (readings). It contains three passages, and each passage is followed by twelve to fourteen questions for a total of thirty-nine to forty-two questions. The passages are generally from 700-900 words long. You have sixty minutes to finish this section. Skills that are tested in this section include the abilities to

- scan for details
- use context clues to understand the meaning of vocabulary
- draw inferences ~ recognize coherence
- understand how the author explains certain points
- understand why the author uses certain examples or mentions certain details
- recognize restatements (paraphrases) and sentence simplifications
- distinguish between important ideas and minor ones
- analyze and categorize information in order to complete summaries and charts

You can skip answers and come back to them later. You can come back and change your answers at any time during the Reading testing period. If you want, you can take notes about the passages while you are reading.

The passages are very similar to the type of material that you would find in an introductory undergraduate university textbook. The passages cover a wide range of topics, but in general can be classified as follows:

1. Science and technology, including astronomy, geology, chemistry, mathematics, physics, biology, medicine, and engineering
2. History, government, geography, and culture
3. Art, including literature, painting, sculpture, dance, drama, and architecture
4. Social science, including anthropology, economics, psychology, urban studies, and sociology
5. Biography and autobiography

Some passages might be classified in more than one way. For example, a biography might be about the life of a historical figure, an artist, or a scientist. Most of the context for the readings is North American (U.S. or sometimes Canadian). However, you may also see some international contexts, especially from English-speaking countries such as the United Kingdom, Australia, and New Zealand. The passages are mainly expository. In other words, they explain something. However, some passages may be narrative (telling the story of an event or a person) or persuasive (arguing in favor of or against some point or issue). Passages may employ various patterns of organization and development: cause and effect, comparison and contrast, definition, classification, and analysis. The vocabulary used in the Reading Section is sophisticated but not unrealistically difficult. Some specialized vocabulary is "glossed" -in other words, it is marked with a blue underline, and you can get a definition by clicking on the word or phrase. If there are words that you don't know that are not glossed, sometimes you can guess the meaning from the context of the sentence. And remember that it is not necessary to understand every word in the passage in order to answer the questions correctly.

Week 1
Factual Questions

When you see these phrases, you know that the information needed for an answer is directly stated somewhere in the passage (unlike answers for inference questions).
Factual questions ask about explicit facts and details given in the passage. They often contain one of the wh-words or phrases: who, what, when, where, why, and so on. Factual questions often begin with the phrase <u>According to:</u>

- **According to the passage,**
- **According to the author,**
- **According to the theories of …**
- **According to the information in paragraph 3, ...**

Factual questions sometimes begin with this phrase:

- **What does the author say about ... ?**

Scanning
To scan is to read quickly to find certain information. To answer factual questions, you must scan the passage or paragraph to locate and identify information that the question asks about. (The question often gives the number of the paragraph where the information is found and marks it with an arrow, which makes your job easier!) If you are not sure from your first reading where in the passage or paragraph to look for specific answers, use the following techniques:

- **Focus on one or two key words from the question. These might be dates, names, or other nouns-something that will be easy to find as you scan. Lock these words in your mind.**
- **Scan the passage as you scroll down looking for these words or their synonyms. Look only for these words. Do not try to read every word of the passage.**
- **Remember that questions generally follow the order of the passage. Therefore, you will usually scroll down from the last question that you answered, not up.**
- **When you find the key words in the passage, carefully read the sentence where they occur. You may have to read the sentences preceding or following that sentence as well.**
- **Compare the information that you read with the answer choices.**
- **Correct answers for factual questions seldom use exactly the same words that the passage uses. They often contain synonyms and have different grammatical structures. There will generally 4-5 factual questions about each of the three passages.**

TPO1

GROUNDWATER

- Groundwater is the word used to describe water that saturates the ground, filling all the available spaces. By far the most abundant type of groundwater is meteoric water; this is the groundwater that circulates as part of the water cycle. Ordinary meteoric water is water that has soaked into the ground from the surface, from precipitation (rain and snow) and from lakes and streams. There it remains, sometimes for long periods, before emerging at the surface again. At first thought it seems incredible that there can be enough space in the "solid" ground underfoot to hold all this water.
- The necessary space is there, however, in many forms. The commonest spaces are those among the particles—sand grains and tiny pebbles—of loose, unconsolidated sand and gravel. Beds of this material, out of sight beneath the soil, are common. They are found wherever fast rivers carrying loads of coarse sediment once flowed. For example, as the great ice sheets that covered North America during the last ice age steadily melted away, huge volumes of water flowed from them. The water was always laden with pebbles, gravel, and sand, known as glacial outwash, that was deposited as the flow slowed down.
- The same thing happens to this day, though on a smaller scale, wherever a sediment-laden river or stream emerges from a mountain valley onto relatively flat land, dropping its load as the current slows: the water usually spreads out fanwise, depositing the sediment in the form of a smooth, fan-shaped slope. Sediments are also dropped where a river slows on entering a lake or the sea, the deposited sediments are on a lake floor or the seafloor at first, but will be located inland at some future date, when the sea level falls or the land rises; such beds are sometimes thousands of meters thick.
- In lowland country almost any spot on the ground may overlie what was once the bed of a river that has since become buried by soil; if they are now below the water's upper surface (the water table), the gravels and sands of the former riverbed, and its sandbars, will be saturated with groundwater.
- So much for unconsolidated sediments. Consolidated (or cemented) sediments, too, contain millions of minute water-holding pores. This is because the gaps among the original grains are often not totally plugged with cementing chemicals; also, parts of the original grains may become dissolved by percolating groundwater, either while consolidation is taking place or at any time afterwards. The result is that sandstone, for example; can be as porous as the loose sand from which it was formed.
- Thus a proportion of the total volume of any sediment, loose or cemented, consists of empty space. Most crystalline rocks are much more solid; a common exception is basalt, a form of solidified volcanic lava, which is sometimes full of tiny bubbles that make it very porous.
- The proportion of empty space in a rock is known as its porosity. But note that porosity is not the same as permeability, which measures the ease with which water can flow through a material; this depends on the sizes of the individual cavities and the crevices linking them.
- Much of the water in a sample of water-saturated sediment or rock will drain from it if the sample is put in a suitable dry place. But some will remain, clinging to all solid surfaces. It is

held there by the force of surface tension without which water would drain instantly from any wet surface, leaving it totally dry. The total volume of water in the saturated sample must therefore be thought of as consisting of water that can, and water that cannot, drain away.

- The relative amount of these two kinds of water varies greatly from one kind of rock or sediment to another, even though their porosities may be the same. What happens depends on pore size. If the pores are large, the water in them will exist as drops too heavy for surface tension to hold, and it will drain away; but if the pores are small enough, the water in them will exist as thin films, too light to overcome the force of surface tension holding them in place; then the water will be firmly held.

1. According to paragraph 2, where is groundwater usually found?

○Inside pieces of sand and gravel

○On top of beds of rock

○In fast rivers that are flowing beneath the soil

○In spaces between pieces of sediment

2. According to paragraphs 6 and 7, why is basalt unlike most crystalline forms of rock?

○It is unusually solid

○It often has high porosity.

○It has a low proportion of empty space.

○It is highly permeable.

The Origin of Theater

- In seeking to describe the origins of theater, one must rely primarily on speculation, since there is little concrete evidence. The most widely accepted theory, championed by anthropologists in the late nineteenth and early twentieth centuries, envisions theater as emerging out of myth and ritual. The process perceived by these anthropologists may be summarized briefly. During the early stages of its development, a society becomes aware of forces that appear to influence or control its food supply and well-being. Having little understanding of natural causes, it attributes both desirable and undesirable occurrences to supernatural or magical forces, and it searches for means to win the favor of these forces. Perceiving an apparent connection between certain actions performed by the group and the result it desires, the group repeats, refines and formalizes those actions into fixed ceremonies, or rituals.
- Stories (myths) may then grow up around a ritual. Frequently the myths include representatives of those supernatural forces that the rites celebrate or hope to influence. Performers may wear costumes and masks to represent the mythical characters or supernatural forces in the rituals or in accompanying celebrations. As a people becomes more sophisticated, its conceptions of supernatural forces and causal relationships may change. As a result, it may abandon or modify some rites. But the myths that have grown up around the rites may continue as part of the group's oral tradition and may even come to be acted out under conditions divorced from these rites. When this occurs, the first step has been taken

toward theater as an autonomous activity, and thereafter entertainment and aesthetic values may gradually replace the former mystical and socially efficacious concerns.

- Although origin in ritual has long been the most popular, it is by no means the only theory about how the theater came into being. Storytelling has been proposed as one alternative. Under this theory, relating and listening to stories are seen as fundamental human pleasures. Thus, the recalling of an event (a hunt, battle, or other feat) is elaborated through the narrator's pantomime and impersonation and eventually through each role being assumed by a different person.
- A closely related theory sees theater as evolving out of dances that ate primarily pantomimic, rhythmical or gymnastic, or from imitations of animal noises and sounds. Admiration for the performer's skill, virtuosity, and grace are seen as motivation for elaborating the activities into fully realized theatrical performances.
- In addition to exploring the possible antecedents of theater, scholars have also theorized about the motives that led people to develop theater. Why did theater develop, and why was it valued after it ceased to fulfill the function of ritual? Most answers fall back on the theories about the human mind and basic human needs. One, set forth by Aristotle in the fourth century B.C., sees humans as naturally imitative—as taking pleasure in imitating persons, things, and actions and in seeing such imitations. Another, advanced in the twentieth century, suggests that humans have a gift for fantasy, through which they seek to reshape reality into more satisfying forms than those encountered in daily life. Thus, fantasy or fiction (of which drama is one form) permits people to objectify their anxieties and fears, confront them, and fulfill their hopes in fiction if not fact. The theater, then, is one tool whereby people define and understand their world or escape from unpleasant realities.
- But neither the human imitative instinct nor a penchant for fantasy by itself leads to an autonomous theater. Therefore, additional explanations are needed. One necessary condition seems to be a somewhat detached view of human problems. For example, one sign of this condition is the appearance of the comic vision, since comedy requires sufficient detachment to view some deviations from social norms as ridiculous rather than as serious threats to the welfare of the entire group. Another condition that contributes to the development of autonomous theater is the emergence of the aesthetic sense. For example, some early societies ceased to consider certain rites essential to their well-being and abandoned them, nevertheless, they retained as parts of their oral tradition the myths that had grown up around the rites and admired them for their artistic qualities rather than for their religious usefulness.

1. According to paragraph 1, theories of the origins of theater

○Are mainly hypothetical

○Are well supported by factual evidence

○Have rarely been agreed upon by anthropologists

○Were expressed in the early stages of theater's development

2. According to paragraph 1, why did some societies develop and repeat ceremonial actions?

○To establish a positive connection between the members of the society

○To help society members better understand the forces controlling their food supply

○To distinguish their beliefs from those of other societies

○To increase the society's prosperity

3. According to paragraph 2, what may cause societies to abandon certain rites?

○Emphasizing theater as entertainment

○Developing a new understanding of why events occur.

○Finding a more sophisticated way of representing mythical characters

○Moving from a primarily oral tradition to a more written tradition

Timberline Vegetation on Mountains

- The transition from forest to treeless tundra on a mountain slope is often a dramatic one. Within a vertical distance of just a few tens of meters, trees disappear as a life-form and are replaced by low shrubs, herbs, and grasses. This rapid zone of transition is called the upper timberline or tree line. In many semiarid areas there is also a lower timberline where the forest passes into steppe or desert at its lower edge, usually because of a lack of moisture.
- The upper timberline, like the snow line, is highest in the tropic and lowest in the polar regions. It ranges from sea level in the polar regions to 4,500 meters in the dry subtropics and 3,500 – 4,500 meters in the moist tropics. Timberline trees are normally evergreens, suggesting that these have some advantage over deciduous trees (those that lose their leaves) in the extreme environments of the upper timberline.
- There are some areas, however, where broadleaf deciduous trees form the timberline. Species of birch, for example, may occur at the timberline in parts of the Himalayas.
- At the upper timberline the trees begin to become twisted and deformed. This is particularly true for trees in the middle and upper latitudes, which tend to attain greater heights on ridges, whereas in the tropics the trees reach their greater heights in the valleys. This is because middle- and upper-latitude timberlines are strongly influenced by the duration and depth of the snow cover. As the snow is deeper and lasts longer in the valleys, trees tend to attain greater heights on the ridges, even though they are more exposed to high-velocity winds and poor, thin soils there. In the tropics, the valleys appear to be more favorable because they are less prone to dry out, they have less frost, and they have deeper soils.
- There is still no universally agreed-on explanation for why there should be such a dramatic cessation of tree growth at the upper timberline. Various environmental factors may play a role. Too much snow, for example, can smother trees, and avalanches and snow creep can damage or destroy them. Late-lying snow reduces the effective growing season to the point where seedlings cannot establish themselves. Wind velocity also increases with altitude and may cause serious stress for trees, as is made evident by the deformed shapes at high altitudes. Some scientists have proposed that the presence of increasing levels of ultraviolet light with elevation may play a role, while browsing and grazing animals like the ibex may be another contributing factor. Probably the most important environmental factor is temperature, for if the growing season is too short and temperatures are too low, tree shoots and buds cannot mature sufficiently to survive the winter months.
- Above the tree line there is zone that is generally called alpine tundra. Immediately adjacent to the timberline, the tundra consists of a fairly complete cover of low-lying shrubs, herbs, and grasses, while higher up the number and diversity of species decrease until there is much bare ground with occasional mosses and lichens and some prostrate cushion plants. Some plants can even survive in favorable microhabitats above the snow line. The highest plants in

the world occur at around 6,100 meters on Makalu in the Himalayas. At this great height, rocks, warmed by the sun, melt small snowdrifts.

- The most striking characteristic of the plants of the alpine zone is their low growth form. This enables them to avoid the worst rigors of high winds and permits them to make use of the higher temperatures immediately adjacent to the ground surface. In an area where low temperatures are limiting to life, the importance of the additional heat near the surface is crucial. The low growth form can also permit the plants to take advantage of the insulation provided by a winter snow cover. In the equatorial mountains the low growth form is less prevalent.

1. Where is the lower timberline mentioned in paragraph 1 likely to be found?

A) In an area that has little water
B) In an area that has little sunlight
C) Above a transition area
D) On a mountain that has no upper timberline

2. According to paragraph 3, which of the following is true of trees in the middle and upper latitudes?

A) Tree growth is negatively affected by the snow cover in valleys.
B) Tree growth is greater in valleys than on ridges.
C) Tree growth on ridges is not affected by high-velocity winds.
D) Tree growth lasts longer in those latitudes than it does in the tropics.

Week 2
Negative Factual Question

Negative factual questions ask you to determine which of the four answer choices is not given in the passage. These questions contain the words not, except, or least, and these words always appear in uppercase (capital) letters.

- **According to the passage, all of the following are true EXCEPT**
- **Which of the following is NOT mentioned in the passage?**

To answer this kind of question, you need to scan the passage to find answers that are correct or that are mentioned in the passage. The correct answer, of course, is the one that does not appear or is mentioned in another context. Sometimes, the three incorrect choices are clustered in one or two sentences. Sometimes they are scattered throughout the passage and will take you more time to find. Negative factual questions take more time to answer than most of the other types of questions. You may want to skip these questions and come back to them later by using the Review feature.

TPO2

THE ORIGINS OF CETACEANS

- How did it come about that farming developed independently in a number of world centers (the Southeast Asian mainland, Southwest Asia, Central America, lowland and highland South America, and equatorial Africa) at more or less the same time? Agriculture developed slowly among populations that had an extensive knowledge of plants and animals. Changing from hunting and gathering to agriculture had no immediate advantages. To start with, it forced the population to abandon the nomad's life and became sedentary, to develop methods of storage and, often, systems of irrigation. While hunter-gatherers always had the option of moving elsewhere when the resources were exhausted, this became more difficult with farming. Furthermore, as the archaeological record shows, the state of health of agriculturalists was worse than that of their contemporary hunter-gatherers.
- Traditionally, it was believed that the transition to agriculture was the result of a worldwide population crisis. It was argued that once hunter-gatherers had occupied the whole world, the population started to grow everywhere and food became scarce; agriculture would have been a solution to this problem. We know, however, that contemporary hunter-gatherer societies control their population in a variety of ways. The idea of a world population crisis is therefore unlikely, although population pressure might have arisen in some areas.
- Climatic changes at the end of the glacial period 13,000 years ago have been proposed to account for the emergence of farming. The temperature increased dramatically in a short period of time (years rather than centuries), allowing for a growth of the hunting-gathering population due to the abundance of resources. There were, however, fluctuations in the climatic conditions, with the consequences that wet conditions were followed by dry ones, so that the availability of plants and animals oscillated brusquely.
- It would appear that the instability of the climatic conditions led populations that had originally been nomadic to settle down and develop a sedentary style of life, which led in turn to population growth and to the need to increase the amount of food available. Farming originated in these conditions. Later on, it became very difficult to change because of the significant expansion of these populations. It could be argued, however, that these conditions are not sufficient to explain the origins of agriculture. Earth had experienced previous periods of climatic change, and yet agriculture had not been developed.
- It is archaeologist Steven Mithen's thesis, brilliantly developed in his book The Prehistory of the Mind(1996), that approximately 40,000 years ago the human mind developed cognitive fluidity, that is, the integration of the specializations of the mind: technical, natural history (geared to understanding the behavior and distribution of natural resources), social intelligence, and the linguistic capacity. Cognitive fluidity explains the appearance of art, religion, and sophisticated speech. Once humans possessed such a mind, they were able to find an imaginative solution to a situation of severe economic crisis such as the farming dilemma described earlier. Mithen proposes the existence of four mental elements to account for the emergence of farming: (1) the ability to develop tools that could be used intensively to harvest and process plant resources; (2) the tendency to use plants and animals as the medium to acquire social prestige and power; (3) the tendency to develop "social relationships" with animals structurally similar to those developed with people—specifically,

the ability to think of animals as people (anthropomorphism) and of people as animals (totemism); and (4) the tendency to manipulate plants and animals.

- The fact that some societies domesticated animals and plants, discovered the use of metal tools, became literate, and developed a state should not make us forget that others developed pastoralism or horticulture (vegetable gardening) but remained illiterate and at low levels of productivity; a few entered the modem period as hunting and gathering societies. It is anthropologically important to inquire into the conditions that made some societies adopt agriculture while others remained hunter-gatherers or horticulturalists. However, it should be kept in mind that many societies that knew of agriculture more or less consciously avoided it. Whether Mithen's explanation is satisfactory is open to contention, and some authors have recently emphasized the importance of other factors.

1. According to paragraph 1, all of the following are advantages of hunting and gathering over agriculture EXCEPT:

O It is a healthier lifestyle.
O It requires less knowledge of plants and animals.
O It does not need storage capabilities.
O It is not tied to any specific location.

2. According to paragraph 3, the abundance of resources fluctuated sharply after the end of the glacial period because

O locally abundant resources were quickly exhausted by hunter-gatherers
O the temperature became much higher in some areas over others
O different types of plants and animals became available as the climate changed
O the amount of rainfall varied radically from one period to the next

3. According to paragraph 5, Steven Mithen believes that all of the following contributed to the emergence of farming EXCEPT

O the development of a mind flexible enough to come up with solutions to complex problems
O the tendency to use plants and animals to acquire power
O the tendency to emphasize the differences between animals and people
O the ability to make tools that could be used for the large-scale harvesting of plants

4. According to paragraph 6, which of the following is a weakness of Mithen's explanation?

O It does not clearly distinguish agriculture from pastoralism and horticulture.
O It fails to explain why some societies adopted agriculture while others did not.
O It explains the domestication of plants and animals but not the development of metal tools.
O It overlooks the fact that illiteracy and low productivity remain problems even today

DESERT FORMATION

- The deserts, which already occupy approximately a fourth of the Earth's land surface, have in recent decades been increasing at an alarming pace. The expansion of desertlike conditions into areas where they did not previously exist is called desertification. It has been estimated that an additional one-fourth of the Earth's land surface is threatened by this process.
- Desertification is accomplished primarily through the loss of stabilizing natural vegetation and the subsequent accelerated erosion of the soil by wind and water. In some cases the loose soil is blown completely away, leaving a stony surface. In other cases, the finer particles may be removed, while the sand-sized particles are accumulated to form mobile hills or ridges of sand.
- Even in the areas that retain a soil cover, the reduction of vegetation typically results in the loss of the soil's ability to absorb substantial quantities of water. The impact of raindrops on the loose soil tends to transfer fine clay particles into the tiniest soil spaces, sealing them and producing a surface that allows very little water penetration. Water absorption is greatly reduced; consequently runoff is increased, resulting in accelerated erosion rates. The gradual drying of the soil caused by its diminished ability to absorb water results in the further loss of vegetation, so that a cycle of progressive surface deterioration is established.
- In some regions, the increase in desert areas is occurring largely as the result of a trend toward drier climatic conditions. Continued gradual global warming has produced an increase in aridity for some areas over the past few thousand years. The process may be accelerated in subsequent decades if global warming resulting from air pollution seriously increases.
- There is little doubt, however, that desertification in most areas results primarily from human activities rather than natural processes. The semiarid lands bordering the deserts exist in a delicate ecological balance and are limited in their potential to adjust to increased environmental pressures. Expanding populations are subjecting the land to increasing pressures to provide them with food and fuel. In wet periods, the land may be able to respond to these stresses. During the dry periods that are common phenomena along the desert margins, though, the pressure on the land is often far in excess of its diminished capacity, and desertification results.
- Four specific activities have been identified as major contributors to the desertification processes: overcultivation, overgrazing, firewood gathering, and overirrigation. The cultivation of crops has expanded into progressively drier regions as population densities have grown. These regions are especially likely to have periods of severe dryness, so that crop failures are common. Since the raising of most crops necessitates the prior removal of the natural vegetation, crop failures leave extensive tracts of land devoid of a plant cover and susceptible to wind and water erosion.
- The raising of livestock is a major economic activity in semiarid lands, where grasses are generally the dominant type of natural vegetation. The consequences of an excessive number of livestock grazing in an area are the reduction of the vegetation cover and the trampling and pulverization of the soil. This is usually followed by the drying of the soil and accelerated erosion.
- Firewood is the chief fuel used for cooking and heating in many countries. The increased pressures of expanding populations have led to the removal of woody plants so that many

cities and towns are surrounded by large areas completely lacking in trees and shrubs. The increasing use of dried animal waste as a substitute fuel has also hurt the soil because this valuable soil conditioner and source of plant nutrients is no longer being returned to the land.

- The final major human cause of desertification is soil salinization resulting from overirrigation. Excess water from irrigation sinks down into the water table. If no drainage system exists, the water table rises, bringing dissolved salts to the surface. The water evaporates and the salts are left behind, creating a white crustal layer that prevents air and water from reaching the underlying soil.
- The extreme seriousness of desertification results from the vast areas of land and the tremendous numbers of people affected, as well as from the great difficulty of reversing or even slowing the process. Once the soil has been removed by erosion, only the passage of centuries or millennia will enable new soil to form. In areas where considerable soil still remains, though, a rigorously enforced program of land protection and cover-crop planting may make it possible to reverse the present deterioration of the surface.

1. According to paragraph 3, the loss of natural vegetation has which of the following consequences for soil?

○Increased stony content
○Reduced water absorption
○Increased numbers of spaces in the soil
○Reduced water runoff

2. According to paragraph 5, in dry periods, border areas have difficulty

○Adjusting to stresses created by settlement
○Retaining their fertility after desertification
○Providing water for irrigating crops
○Attracting populations in search of food and fuel

3. According to paragraph 6, which of the following is often associated with raising crops?

○Lack of proper irrigation techniques
○Failure to plant crops suited to the particular area
○Removal of the original vegetation
○Excessive use of dried animal waste

4. According to paragraph 9, the ground's absorption of excess water is a factor in desertification because it can

○Interfere with the irrigation of land
○Limit the evaporation of water
○Require more absorption of air by the soil
○Bring salts to the surface

5. All of the following are mentioned in the passage as contributing to desertification EXCEPT

○Soil erosion
○Global warming
○Insufficient irrigation
○The raising of livestock

Early Cinema

- The cinema did not emerge as a form of mass consumption until its technology evolved from the initial "peepshow" format to the point where images were projected on a screen in a darkened theater. In the peepshow format, a film was viewed through a small opening in a machine that was created for that purpose. Thomas Edison's peepshow device, the Kinetoscope, was introduced to the public in 1894. It was designed for use in Kinetoscope parlors, or arcades, which contained only a few individual machines and permitted only one customer to view a short, 50-foot film at any one time. The first Kinetoscope parlors contained five machines. For the price of 25 cents (or 5 cents per machine), customers moved from machine to machine to watch five different films (or, in the case of famous prizefights, successive rounds of a single fight).

- These Kinetoscope arcades were modeled on phonograph parlors, which had proven successful for Edison several years earlier. In the phonograph parlors, customers listened to recordings through individual ear tubes, moving from one machine to the next to hear different recorded speeches or pieces of music. The Kinetoscope parlors functioned in a similar way. Edison was more interested in the sale of Kinetoscopes (for roughly $1,000 apiece) to these parlors than in the films that would be run in them (which cost approximately $10 to $15 each). He refused to develop projection technology, reasoning that if he made and sold projectors, then exhibitors would purchase only one machine-a projector-from him instead of several.

- Exhibitors, however, wanted to maximize their profits, which they could do more readily by projecting a handful of films to hundreds of customers at a time (rather than one at a time) and by charging 25 to 50 cents admission. About a year after the opening of the first Kinetoscope parlor in 1894, showmen such as Louis and Auguste Lumiere, Thomas Armat and Charles Francis Jenkins, and Orville and Woodville Latham (with the assistance of Edison's former assistant, William Dickson) perfected projection devices. These early projection devices were used in vaudeville theaters, legitimate theaters, local town halls, makeshift storefront theaters, fairgrounds, and amusement parks to show films to a mass audience.

- With the advent of projection in 1895-1896, motion pictures became the ultimate form of mass consumption. Previously, large audiences had viewed spectacles at the theater, where vaudeville, popular dramas, musical and minstrel shows, classical plays, lectures, and slide-and-lantern shows had been presented to several hundred spectators at a time. But the movies differed significantly from these other forms of entertainment, which depended on either live performance or (in the case of the slide-and-lantern shows) the active involvement of a master of ceremonies who assembled the final program.

- Although early exhibitors regularly accompanied movies with live acts, the substance of the movies themselves is mass-produced, prerecorded material that can easily be reproduced by theaters with little or no active participation by the exhibitor. Even though early exhibitors shaped their film programs by mixing films and other entertainments together in whichever way they thought would be most attractive to audiences or by accompanying them with lectures, their creative control remained limited. What audiences came to see was the technological marvel of the movies; the lifelike reproduction of the commonplace motion of trains, of waves striking the shore, and of people walking in the street; and the magic made possible by trick photography and the manipulation of the camera.

- With the advent of projection, the viewer's relationship with the image was no longer private, as it had been with earlier peepshow devices such as the Kinetoscope and the Mutoscope, which was a similar machine that reproduced motion by means of successive images on individual photographic cards instead of on strips of celluloid. It suddenly became public-an experience that the viewer shared with dozens, scores, and even hundreds of others. At the same time, the image that the spectator looked at expanded from the minuscule peepshow dimensions of 1 or 2 inches (in height) to the life-size proportions of 6 or 9 feet.

1. According to paragraph 1, all of the following were true of viewing films in Kinetoscope parlors EXCEPT:

One individual at a time viewed a film.

Customers could view one film after another.

Prizefights were the most popular subjects for films.

Each film was short.

2. According to paragraph 4, how did the early movies differ from previous spectacles that were presented to large audiences?

They were a more expensive form of entertainment.

They were viewed by larger audiences.

They were more educational.

They did not require live entertainers.

3. According to paragraph 5, what role did early exhibitors play in the presentation of movies in theaters?

They decided how to combine various components of the film program.

They advised film-makers on appropriate movie content.

They often took part in the live-action performances.

They produced and prerecorded the material that was shown in the theaters.

4. According to paragraph 6, the images seen by viewers in the earlier peepshows, compared to the images projected on the screen, were relatively

Small in size

Inexpensive to create

Unfocused

Limited in subject matter

Week 3
Vocabulary Questions

Vocabulary questions ask about the meaning of words or phrases in the passage. You have to decide which of four words or phrases is closest in meaning to the word from the passage. Most vocabulary questions ask about single words (usually nouns, verbs, or adjectives). Some ask about phrases involving several words. There will generally be two to four vocabulary questions about each of the three passages (six to twelve per Reading Section).
You can often use other words in the same sentence or in nearby sentences as clues to get an idea of the meaning of the expression you are being asked about. These surrounding words are called the context.

- **Synonyms**

The first state to institute compulsory education was Massachusetts, which made it mandatory for students to attend school twelve weeks a year.
The word mandatory is a synonym for the word compulsory. If it is mandatory to attend school twelve weeks a year, then compulsory education must mean "mandatory," "required," "necessary."

- **Examples**

Many gardeners use some kind of mulch such as chopped leaves, peat moss, grass clippings, pine needles, or wood chips, in order to stop the growth of weeds and to hold in water.
From all the examples given, it is clear that mulch means "material from plants."

- **Contrast**

In the 1820's, the Southern states supported improvements in the national transportation system, but the Northern states balked.
Because the Southern states supported improvements, and because a word is used that indicates contrast between the first part of the sentence and the second part (but), then the word balked must have a meaning that is basically the opposite of supported. In other words, the Northern states must have "refused to support" improvements, or "been against" improvements.

- **Word Analysis**

A tiger standing in tall grass is almost invisible because of its striped markings.
The prefix in- often means "not." The root -vis- means "see." The suffix -ible means "able to be." Even if you are not familiar with the word invisible, you could probably guess that it means "not able to be seen."

- **General Context**

In a desert, vegetation is so scanty that it is incapable of supporting any large human population.
As is generally known, deserts contain little vegetation, so clearly the word scanty must mean "scarce" or "barely sufficient."

You can use any of these techniques to help you answer vocabulary questions about the passages. These are the steps that you should follow when you answer vocabulary questions:
1. Look at the highlighted word or phrase and the four answer choices. If you are familiar with the word, guess which answer is correct, but don't click on the answer yet.
2. Read the sentence in which the word appears. (The word will be highlighted so it will be easy to find.) See

if context clues in the sentence or in the sentences before or after help you guess the correct meaning.

3. If context clues do not help you guess the meaning of the word, use word analysis. In other words, see if the prefix, root, or suffix can help you understand the word.

4. If you still are not sure which answer is correct, read the sentence to yourself with each of the four answer choices in place. Does one seem more logical, given the context of the sentence, than the other three? If not, do any seem illogical? If so, you can eliminate those.

5. If you are still not sure, make the best guess that you can and go on. If you have time, come back to this question later.

TPO3

ARCHITECTURE

- Architecture is the art and science of designing structures that organize and enclose space for practical and symbolic purposes. Because architecture grows out of human needs and aspirations, it clearly communicates cultural values. Of all the visual arts, architecture affects our lives most directly for it determines the character of the human environment in major ways.
- Architecture is a three-dimensional form. It utilizes space, mass, texture, line, light, and color. To be architecture, a building must achieve a working harmony with a variety of elements. Humans instinctively seek structures that will shelter and enhance their way of life. It is the work of architects to create buildings that are not simply constructions but also offer inspiration and delight. Buildings contribute to human life when they provide shelter, enrich space, complement their site, suit the climate, and are economically feasible. The client who pays for the building and defines its function is an important member of the architectural team. The mediocre design of many contemporary buildings can be traced to both clients and architects.
- In order for the structure to achieve the size and strength necessary to meet its purpose, architecture employs methods of support that, because they are based on physical laws, have changed little since people first discovered them-even while building materials have changed dramatically. The world's architectural structures have also been devised in relation to the objective limitations of materials. Structures can be analyzed in terms of how they deal with downward forces created by gravity. They are designed to withstand the forces of compression (pushing together), tension (pulling apart), bending, or a combination of these in different parts of the structure.
- Even development in architecture has been the result of major technological changes. Materials and methods of construction are integral parts of the design of architecture structures. In earlier times it was necessary to design structural systems suitable for the materials that were available, such as wood, stone, brick. Today technology has progressed to the point where it is possible to invent new building materials to suit the type of structure desired. Enormous changes in materials and techniques of construction within the last few generations have made it possible to enclose space with much greater ease and speed and with a minimum of material. Progress in this area can be measured by the difference in weight between buildings built now and those of comparable size built one hundred ago.
- Modern architectural forms generally have three separate components comparable to elements of the human body; a supporting skeleton or frame, an outer skin enclosing the interior spaces, equipment, similar to the body's vital organs and systems. The equipment includes plumbing, electrical wiring, hot water, and air-conditioning. Of course in early architecture—such as igloos and adobe structures—there was no such equipment, and the skeleton and skin were often one.
- Much of the world's great architecture has been constructed of stone because of its beauty, permanence, and availability. In the past, whole cities grew from the arduous task of cutting and piling stone upon. Some of the world's finest stone architecture can be seen in the ruins

of the ancient Inca city of Machu Picchu high in the eastern Andes Mountains of Peru. The doorways and windows are made possible by placing over the open spaces thick stone beams that support the weight from above. A structural invention had to be made before the physical limitations of stone could be overcome and new architectural forms could be created. That invention was the arch, a curved structure originally made of separate stone or brick segments. The arch was used was used by the early cultures of the Mediterranean area chiefly for underground drains, but it was the Romans who first developed and used the arch extensively in aboveground structures. Roman builders perfected the semicircular arch made of separate blocks of stone. As a method of spanning space, the arch can support greater weight than a horizontal beam. It works in compression to divert the weight above it out to the sides, where the weight is borne by the vertical elements on either side of the arch. The arch is among the many important structural breakthroughs that have characterized architecture throughout the centuries.

1. According to paragraph 1, all of the following statements about architecture are true EXCEPT:

○Architecture is visual art.
○Architecture reflects the cultural values of its creators.
○Architecture has both artistic and scientific dimensions.

○Architecture has an indirect effect on life.

2. The word "feasible" in the passage is closet in meaning to

○In existence ○ Without question ○Achievable ○Most likely

3. The word "devised" in the passage is closest in meaning to

○Combined ○Created ○Introduced ○Suggested

4. The word "integral" is closet in meaning to

○Essential ○Variable ○Practical ○Independent

5. Which of the following correctly characterizes the relationship between the human body and architecture that is described in paragraph5?

○Complex equipment inside buildings is the one element in modern architecture that resembles a component of the human body.

○The components in early buildings were similar to three particular elements of the human body.

○Modern buildings have components that are as likely to change as the human body is.
○In general, modern buildings more closely resemble the human body than earlier buildings do.

6. The word "arduous" in the passage is closest in meaning to

○Difficult ○Necessary ○Skilled ○Shared

The Long-Term Stability of Ecosystems

- Plant communities assemble themselves flexibly, and their particular structure depends on the specific history of the area. Ecologists use the term "succession" to refer to the changes that happen in plant communities and ecosystems over time. The first community in a succession is called a pioneer community, while the long-lived community at the end of succession is called a climax community.
- Pioneer and successional plant communities are said to change over periods from 1 to 500 years. These changes—in plant numbers and the mix of species—are cumulative. Climax communities themselves change but over periods of time greater than about 500 years.
- An ecologist who studies a pond today may well find it relatively unchanged in a year's time. Individual fish may be replaced, but the number of fish will tend to be the same from one year to the next. We can say that the properties of an ecosystem are more stable than the individual organisms that compose the ecosystem.
- At one time, ecologists believed that species diversity made ecosystems stable. They believed that the greater the diversity the more stable the ecosystem. Support for this idea came from the observation that long-lasting climax communities usually have more complex food webs and more species diversity than pioneer communities. Ecologists concluded that the apparent stability of climax ecosystems depended on their complexity. To take an extreme example, farmlands dominated by a single crop are so unstable that one year of bad weather or the invasion of a single pest can destroy the entire crop. In contrast, a complex climax community, such as a temperate forest, will tolerate considerable damage from weather of pests.
- The question of ecosystem stability is complicated, however. The first problem is that ecologists do not all agree what "stability" means. Stability can be defined as simply lack of change. In that case, the climax community would be considered the most stable, since, by

definition, it changes the least over time. Alternatively, stability can be defined as the speed with which an ecosystem returns to a particular form following a major disturbance, such as a fire. This kind of stability is also called resilience. In that case, climax communities would be the most fragile and the least stable, since they can require hundreds of years to return to the climax state.

- Even the kind of stability defined as simple lack of change is not always associated with maximum diversity. At least in temperate zones, maximum diversity is often found in mid-successional stages, not in the climax community. Once a redwood forest matures, for example, the kinds of species and the number of individuals growing on the forest floor are reduced. In general, diversity, by itself, does not ensure stability. Mathematical models of ecosystems likewise suggest that diversity does not guarantee ecosystem stability—just the opposite, in fact. A more complicated system is, in general, more likely than a simple system to break down. A fifteen-speed racing bicycle is more likely to break down than a child's tricycle.
- Ecologists are especially interested to know what factors contribute to the resilience of communities because climax communities all over the world are being severely damaged or destroyed by human activities. The destruction caused by the volcanic explosion of Mount St. Helens, in the northwestern United States, for example, pales in comparison to the destruction caused by humans. We need to know what aspects of a community are most important to the community's resistance to destruction, as well as its recovery.
- A local population that goes extinct is quickly replaced by immigrants from an adjacent community. Even if the new population is of a different species, it can approximately fill the niche vacated by the extinct population and keep the food web intact.
- Many ecologists now think that the relative long-term stability of climax communities comes not from diversity but from the "patchiness" of the environment, an environment that varies from place to place supports more kinds of organisms than an environment that is uniform. A local population that goes extinct is quickly replaced by immigrants from an adjacent community. Even if the new population is of a different species, it can approximately fill the niche vacated by the extinct population and keep the food web intact.

1． The word " particular" in the passage is closest in meaning to

○Natural ○Final ○Specific ○Complex

2． According to paragraph 1, which of the following is NOT true of climax communities?

○They occur at the end of a succession.

○They last longer than any other type of community.

○The numbers of plants in them and the mix of species do not change

○They remain stable for at least 500 years at a time.

３． According to paragraph 2, which of the following principles of ecosystems can be learned by studying a pond?

○Ecosystem properties change more slowly than individuals in the system.
○The stability of an ecosystem tends to change as individuals are replaced.
○Individual organisms are stable from one year to the next.
○A change in the numbers of an organism does not affect an ecosystem's properties

４． According to paragraph 3, ecologists once believed that which of the following illustrated the most stable ecosystems?

○Pioneer communities

○Climax communities

○Single-crop farmlands
○Successional plant communities

５． According to paragraph 4, why is the question of ecosystem stability complicated?

○The reasons for ecosystem change are not always clear.
○Ecologists often confuse the word "stability" with the word "resilience."
○The exact meaning of the word "stability" is debated by ecologists.

○There are many different answers to ecological questions.

６． According to paragraph 4, which of the following is true of climax communities?

○They are more resilient than pioneer communities.
○They can be considered both the most and the least stable communities.
○They are stable because they recover quickly after major disturbances.
○They are the most resilient communities because they change the least over time.

7. The word "guarantee" in the passage is closest in meaning to

○Increase ○Ensure ○Favor ○Complicate

8. The word "pales" in the passage is closest in meaning to

○Increases proportionally ○Differs ○Loses significance ○Is common

9. The word "adjacent" in the passage is closest in meaning to

○Foreign ○Stable ○Fluid ○Neighboring

Depletion of the Ogallala Aquifer

- The vast grasslands of the High Plains in the central United States were settled by farmers and ranchers in the 1880's. This region has a semiarid climate, and for 50 years after its settlement, it supported a low-intensity agricultural economy of cattle ranching and wheat farming. In the early twentieth century, however, it was discovered that much of the High Plains was underlain by a huge aquifer (a rock layer containing large quantities of groundwater). This aquifer was named the Ogallala aquifer after the Ogallala Sioux Indians, who once inhabited the region.
- The Ogallala aquifer is a sandstone formation that underlies some 583,000 square kilometers of land extending from northwestern Texas to southern South Dakota. Water from rains and melting snows has been accumulating in the Ogallala for the past 30,000 years. Estimates indicate that the aquifer contains enough water to fill Lake Huron, but unfortunately, under the semiarid climatic conditions that presently exist in the region, rates of addition to the aquifer are minimal, amounting to about half a centimeter a year.
- The first wells were drilled into the Ogallala during the drought years of the early 1930's. The ensuring rapid expansion of irrigation agriculture, especially from the 1950's onward, transformed the economy of the region. More than 100,000 wells now tap the Ogallala. Modern irrigation devices, each capable of spraying 4.5 million liters of water a day, have produced a landscape dominated by geometric patterns of circular green islands of crops. Ogallala water has enabled the High Plains region to supply significant amounts of the cotton, sorghum, wheat, and corn grown in the United States. In addition, 40 percent of American grain-fed beef cattle are fattened here.
- This unprecedented development of a finite groundwater resource with an almost negligible natural recharge rate—that is, virtually no natural water source to replenish the water supply—has caused water tables in the region to fall drastically. In the 1930's, wells encountered plentiful water at a depth of about 15 meters; currently, they must be dug to depths of 45 to 60 meters or more. In places, the water table is declining at a rate of a meter a year, necessitating the periodic deepening of wells and the use of ever-more-powerful pumps. It is estimated that at current withdrawal rates, much of the aquifer will run dry within 40 years. The situation is most critical in Texas, where the climate is driest, the greatest amount of water is being pumped, and the aquifer contains the least water. It is projected that the remaining Ogallala water will, by the year 2030, support only 35 to 40 percent of the irrigated acreage in Texas that is supported in 1980.
- The reaction of farmers to the inevitable depletion of the Ogallala varies. Many have been attempting to conserve water by irrigating less frequently or by switching to crops that require less water. Other, however, have adopted the philosophy that it is best to use the water while it is still economically profitable to do so and to concentrate on high-value crops such as cotton. The incentive of the farmers who wish to conserve water is reduced by their knowledge that many of their neighbors are profiting by using great amounts of water, and in the process are drawing down the entire region's water supplies.

- In the face of the upcoming water supply crisis, a number of grandiose schemes have been developed to transport vast quantities of water by canal or pipeline from the Mississippi, the Missouri, or the Arkansas rivers. Unfortunately, the cost of water obtained through any of these schemes would increase pumping costs at least tenfold, making the cost of irrigated agricultural products from the region uncompetitive on the national and international markets. Somewhat more promising have been recent experiments for releasing capillary water (water in the soil) above the water table by injecting compressed are into the ground. Even if this process proves successful, however, it would almost triple water costs. Genetic engineering also may provide a partial solution, as new strains of drought-resistant crops continue to be developed. Whatever the final answer to the water crisis may be, it is evident that within the High Plains, irrigation water will never again be the abundant, inexpensive resource it was during the agricultural boom years of the mid-twentieth century.

1. According to paragraph 1, which of the following statements about the High Plains is true?

○Until farmers and ranchers settled there in the 1880's, the High Plains had never been inhabited.
○The climate of the High Plains is characterized by higher-than-average temperatures.
○The large aquifer that lies underneath the High Plains was discovered by the Ogallala Sioux Indians.
○Before the early 1900's there was only a small amount of farming and ranching in the High Plains.

2. According to paragraph 2, all of the following statements about the Ogallala aquifer are true EXCEPT:

○The aquifer stretches from South Dakota to Texas.
○The aquifer's water comes from underground springs.
○Water has been gathering in the aquifer for 30,000 years.

○The aquifer's water is stored in a layer of sandstone.

3. The word "ensuring" in the passage is closest in meaning to
○Continuing ○Surprising ○Initial ○Subsequent

4. The word "unprecedented" in the passage is closest in meaning to

○Difficult to control
○Without any restriction
○Unlike anything in the past
○Rapidly expanding

5. The word "virtually" in the passage is closest in meaning to

○Clearly ○Perhaps ○Frequently ○Almost

6. According to paragraph 4, all of following are consequences of the heavy use of the Ogallala aquifer for irrigation EXCEPT:

○The recharge rate of the aquifer is decreasing.
○Water tables in the region are becoming increasingly lower.
○Wells now have to be dug to much greater depths than before.
○Increasingly powerful pumps are needed to draw water from the aquifer.

7. According to paragraph 4, compared with all other states that use Ogallala water for irrigation, Texas

○Has the greatest amount of farmland being irrigated with Ogallala water
○Contains the largest amount of Ogallala water underneath the soil
○Is expected to face the worst water supply crisis as the Ogallala runs dry
○Uses the least amount of Ogallala water for its irrigation needs

8. The word "inevitable" in the passage is closest in meaning to

○Unfortunate ○Predictable ○Unavoidable ○Final

9. Paragraph 5 mentions which of the following as a source of difficulty for some farmers who try to conserve water?

○Crops that do not need much water are difficult to grow in the High Plains.
○Farmers who grow crops that need a lot of water make higher profits.
○Irrigating less frequently often leads to crop failure.
○Few farmers are convinced that the aquifer will eventually run dry.

10. According to paragraph 6, what is the main disadvantage of the proposed plans to transport river water to the High Plains?

○The rivers cannot supply sufficient water for the farmer's needs.
○Increased irrigation costs would make the products too expensive.
○The costs of using capillary water for irrigation will increase.
○Farmers will be forced to switch to genetically engineered crops.

Week 4
Purpose and Method Questions

Some questions in the Reading Section ask why an author does something in a passage (a purpose question), how an author does something in a passage (a method question), or what an author thinks about something in the passage (an opinion question)

Purpose questions ask why the author of a passage (or someone that the author quotes) uses a certain piece of information in the passage. ETS calls this kind of question a "rhetorical purpose" question. This kind of question really asks you about the development of the passage. In other words, it asks you why an author makes a point or why the author supports and strengthens a point in a certain way. The question may ask you why the author

• mentions a specific piece of information

• uses a certain example

• refers to a study

• uses a certain sequence or order of events

• makes a comparison • quotes a person or a document

• uses a particular word or phrase

Purpose questions may also ask you the importance of a sentence or paragraph to the passage. Here are some examples of purpose questions:

- **Why does the author first discuss….and then discuss….. ?**
- **The author's main purpose in paragraph…. is to ...**
- **The author quotes…. to show that ...**
- **The phrase in paragraph… is used to illustrate the effect of ...**
- **Why does the author provide details about in paragraph ….?**
- **The author refers to…..to indicate that ...**
- **….in paragraph… is given as an example of ...**
- **Why does the author mention in paragraph…?**
- **Why does the author give an example of ….?**

Method questions ask how the author of a passage (or someone that the author quotes) explains something or accomplishes something in the passage. Again, these questions are really about the development of the passage. How does the author strengthen or clarify a point that he or she has made? The question may ask how the author ...

- **explains a concept**
- **supports an idea or a theme or an argument**
- **clarifies an idea**
- **introduces a topic**
- **gives an example**
- **shows the importance of a person, development, or idea**

Here are some examples of method questions:

In paragraph…., the author explains the concept of …..by…
How does the author explain the idea of in paragraph …?
The author illustrates the idea of….by …..
The author shows the significance of…..by ...

TPO4

Cave Art in Europe

- The earliest discovered traces of art are beads and carvings, and then paintings, from sites dating back to the Upper Paleolithic period. We might expect that early artistic efforts would be crude, but the cave paintings of Spain and southern France show a marked degree of skill. So do the naturalistic paintings on slabs of stone excavated in southern Africa. Some of those slabs appear to have been painted as much as 28,000 years ago, which suggests that painting in Africa is as old as painting in Europe. But painting may be even order than that. The early Australians may have painted on the walls of rock shelters and cliff faces at least 30,000 years ago, and maybe as much as 60,000 years ago.
- The researchers Peter Ucko and Andree Rosenfeld identified three principal locations of paintings in the caves of western Europe: (1) in obviously inhabited rock shelters and cave entrances; (2) in galleries immediately off the inhabited areas of caves; and (3) in the inner reaches of caves, whose difficulty of access has been interpreted by some as a sign that magical-religious activities were performed there.
- The subjects of the paintings are mostly animals. The paintings rest on bare walls, with no backdrops or environmental trappings. Perhaps, like many contemporary peoples, Upper Paleolithic men and women believed that the drawing of a human image could cause death of injury, and if that were indeed their belief, it might explain why human figures are rarely depicted in cave art. Another explanation for the focus on animals might be that these people sought to improve their luck at hunting. This theory is suggested by evidence of chips in the painted figures, perhaps made by spears thrown at the drawings. But if improving their hunting luck was the chief motivation for the paintings, it is difficult to explain why only a few show signs of having been speared. Perhaps the paintings were inspired by the need to increase the supply of animals. Cave art seems to have reached a peak toward the end of the Upper Paleolithic period, when the herds of game were decreasing.
- The particular symbolic significance of the cave paintings in southwestern France is more explicitly revealed, perhaps, by the results of a study conducted by researchers Patricia Rice and Ann Paterson. The data they present suggest that the animals portrayed in the cave paintings were mostly the ones that the painters preferred for meat and for materials such as hides. For example, wild cattle (bovines) and horses are portrayed more often than we would expect by chance, probably because they were larger and heavier (meatier) than other animals in the environment. In addition, the paintings mostly portray animals that the painters may have feared the most because of their size, speed, natural weapons such as tusks and horns, and the unpredictability of their behavior. That is, mammoths, bovines, and horses are portrayed more often than deer and reindeer. Thus, the paintings are consistent with the idea that the art is related to the importance of hunting in the economy of Upper Paleolithic people. Consistent with this idea, according to the investigators, is the fact that the art of the cultural period that followed the Upper Paleolithic also seems to reflect how people got their food.

But in that period, when getting food no longer depended on hunting large game animals (because they were becoming extinct), the art ceased to focus on portrayals of animals.

- Upper Paleolithic art was not confined to cave paintings. Many shafts of spears and similar objects were decorated with figures of animals. The anthropologist Alexander Marshack has an interesting interpretation of some of the engravings made during the Upper Paleolithic. He believes that as far back as 30.000 B.C., hunters may have used a system of notation, engraved on bone and stone, to mark phases of the Moon. If this is true, it would mean that Upper Paleolithic people were capable of complex thought and were consciously aware of their environment. In addition to other artworks, figurines representing the human female in exaggerated form have also been found at Upper Paleolithic sites. It has been suggested that these figurines were an ideal type or an expression of a desire fertility.

1. The word "marked" in the passage is closest in meaning to

○considerable ○surprising ○limited ○adequate

2. Paragraph 1 supports which of the following statements about painting in Europe?

○It is much older than painting in Australia.

○It is as much as 28,000 years old.

○It is not as old as painting in southern Africa.

○It is much more than 30,000 years old.

3. The word "principal" in the passage is closest in meaning to

○major ○likely ○well protected ○distinct

4. According to paragraph 2, what makes some researchers think that certain cave paintings were connected with magical-religious activities?

○The paintings were located where many people could easily see them, allowing groups of people to participate in the magical-religious activities.

○Upper Paleolithic people shared similar beliefs with contemporary peoples who use paintings of animals in their magical-religious rituals.

○Evidence of magical-religious activities has been found in galleries immediately off the inhabited areas of caves.

○The paintings were found in hard-to-reach places away from the inhabited parts of the cave.

5. The word "trappings" in the passage is closest in meaning to

○conditions ○problems ○influences ○decorations

6. According to paragraph 3, scholars explained chips in the painted figures of animals by proposing that

○Upper Paleolithic artists used marks to record the animals they had seen
○the paintings were inspired by the need to increase the supply of animals for hunting
○the artists had removed rough spots on the cave walls
○Upper Paleolithic people used the paintings to increase their luck at hunting

7. Why does the author mention that Upper Paleolithic cave art seemed to have "reached a peak toward the end of the Upper Paleolithic period, when the herds of game were decreasing."?

○To argue that Upper Paleolithic art creased to include animals when herds of game became scarce
○To provide support for the idea that the aim of the paintings was to increase the supply of animals for hunting
○To emphasize the continued improvement in the quality of cave art throughout the Upper Paleolithic period
○To show the direct connection between the decrease in herds of game and the end of the Upper Paleolithic period

8. According to paragraph 4, scholars believe that wild cattle, horses, and mammoths are the animals most frequently portrayed in cave paintings for all of the following reasons EXPECT:

○These animals were difficult to hunt because their unpredictable behavior.
○People preferred these animals for their meat and for their skins.
○The painters admired the beauty of these large animals.
○People feared these animals because of their size and speed.

9. According to paragraph 4, which of the following may best represent the attitude of hunters toward deer and reindeer in the Upper Paleolithic period?

○Hunters did not fear deer and reindeers as much as they did large game animals such as horses and mammoths.
○Hunters were not interested in hunting deer and reindeer because of their size and speed.
○Hunters preferred the meat and hides of deer and reindeer to those of other animals.

○Hunters avoided deer and reindeer because of their natural weapons, such as horns.

10. According to paragraph 4, what change is evident in the art of the period following the Upper Paleolithic?

○This new art starts to depict small animals rather than large ones.
○This new art ceases to reflect the ways in which people obtained their food.
○This new art no longer consists mostly of representations of animals.
○This new art begins to show the importance of hunting to the economy.

11. According to paragraph 5, which of the following has been used as evidence to suggest that Upper Paleolithic people were capable of complex thought and conscious awareness of their environment?

○They engraved animal figures on the shafts of spears and other objects.
○They may have used engraved signs to record the phases of the Moon.
○Their figurines represented the human female in exaggerated form.
○They may have used figurines to portray an ideal type or to express a desire for fertility.

Deer Populations of the Puget Sound

- Two species of deer have been prevalent in the Puget Sound area of Washington State in the Pacific Northwest of the United States. The black-tailed deer, lowland, west-side cousin of the mule deer of eastern Washington, is now the most common. The other species, the Columbian white-tailed deer, in earlier times was common in the open prairie country, it is now restricted to the low, marshy islands and flood plains along the lower Columbia River.
- Nearly any kind of plant of the forest understory can be part of a deer's diet. Where the forest inhibits the growth of grass and other meadow plants, the black-tailed deer browses on huckleberry, salal, dogwood, and almost any other shrub or herb. But this is fair-weather feeding. What keeps the black-tailed deer a lived in the harsher seasons of plant decoy and dormancy? One compensation for not hibernating is the built- in urge to migrate. Deer may move from high-elevation browse areas in summer down to the lowland areas in late fall. Even with snow on the ground, the high bushy understory is exposed; also snow and wind bring down leafy branches of cedar, hemlock, red alder, and other arboreal fodder.
- The numbers of deer have fluctuated markedly since the entry of Europeans into Puget Sound country. The early explorers and settlers told of abundant deer in the early 1800s and yet almost in the same breath bemoaned the lack of this succulent game animal. Famous explorers of the North American frontier, Lewis and had experienced great difficulty finding game west of the Rockies and not until the second of December did they kill their first elk. To keep 40 people alive that winter, they consumed approximately 150 elk and 20 deer. And when game moved out of the lowlands in early spring, the expedition decided to return east rather than face possible starvation. Later on in the early years of the nineteenth century, when Fort Vancouver became the headquarters of the Hudson's Bay Company, deer populations

continued to fluctuate. David Douglas, Scottish botanical explorer of the 1830s. Found a disturbing change in the animal life around the fort during the period between his first visit in 1825 and his final contact with the fort in 1832. A recent Douglas biographer states:" The deer which once picturesquely dotted the meadows around the fort were gone [in 1832], hunted to extermination in order to protect the crops."

- Reduction in numbers of game should have boded ill for their survival in later times. A worsening of the plight of deer was to be expected as settlers encroached on the land, logging, burning, and clearing, eventually replacing a wilderness landscape with roads, cities, towns, and factories. No doubt the numbers of deer declined still further. Recall the fate of the Columbian white-tailored deer, now in a protected status. But for the black-tailed deer, human pressure has had just the opposite effect. Wild life zoologist Hulmut Buechner(1953), in reviewing the nature of biotic changes in Washington through recorded time, Says that "since the early 1940s, the state has had more deer than at any other time in its history, the winter population fluctuating around approximately 320,000 deer (mule and black-tailed deer), which will yield about 65,000 of either sex and any age annually for an indefinite period
- The causes of this population rebound are consequences of other human actions. First, the major predators of deer---wolves, cougar, and lynx--have been greatly reduced in numbers. Second, conservation has been insured by limiting times for and types of hunting. But the most profound reason for the restoration of high population numbers has been the gate of the forests. Great tracts of lowland country deforested by logging, fire, or both have become ideal feeding grounds of deer. In addition to finding an increase of suitable browse, like huckleberry and vine maple, Arthur Einarsen, longtime game biologist in the Pacific Northwest, found quality of browse in the open areas to be substantially more nutritive. The protein content of shade- grown vegetation, for example, was much lower than that for plants grown in clearings.

1．According to paragraph 1, which of the following is true of the white-tailed deer of Puget Sound?

○It is native to lowlands and marshes.

○It is more closely related to the mule deer of eastern Washington than to other types of deer.

○It has replaced the black-tailed deer in the open prairie.

○It no longer lives in a particular type of habitat that it once occupied.

2．The word "inhibits" in the passage is closest in meaning to

○ consists of ○ combines ○ restricts ○ establishes

3．The phrase " in the same breath " in the passage is closest in meaning to

○ impatiently ○ humorously ○ continuously ○ Immediately

4. The author tells the story of the explorers Lewis and Clark in paragraph 3 in order to illustrate which of the following points?

○The number of deer within the Puget sound region has varied over time.
○Most of the explorers who came to the Puget sound area were primarily interested than in the West.
○There was more game for hunting in the East of the United States than in the West.
○Individual explorers were not as successful at locating games as were the trading companies.

5. According to paragraph 3, how had Fort Vancouver changed by the time David Douglas returned in 1832?

○The fort had become the headquarters for the Hudson's Bay Company.
○Deer had begun populating the meadows around the fort.
○Deer populations near the fort had been destroyed.
○Crop yields in the area around the fort had decreased.

6. Why does the author ask readers to recall "the fate of the Columbian white-tailored deer" in the discussion of changes in the wilderness landscape?

○To provide support for the idea that habitat destruction would lead to population decline
○To compare how two species of deer caused biotic changes in the wilderness environment
○To provide an example of a species of deer that has successfully adapted to human settlement
○To argue that some deer species must be given a protected status

7. The phrase "indefinite period" in the passage is closest in meaning to period

○ whose end has not been determined

○ that does not begin when expected

○ that lasts only briefly
○ whose importance remains unknown

8. Which of the following statements about deer populations is supported by the information in paragraph 4?

○Deer populations reached their highest point during the 1940s and then began to decline.
○The activities of settlers contributed in unexpected ways to the growth of some deer populations in later times.
○The cleaning of wilderness land for construction caused biotic changes from which the black-tailed deer population has never recovered.
○Since the 1940s the winter populations of deer have fluctuated more than the summer populations have.

9. The word "rebound" in the passage is closest in meaning to

○ decline ○ recovery ○ exchange ○ movement

10. Which of the following is NOT mentioned in paragraph 5 as a factor that has increased deer populations?

○A reduction in the number of predators
○Restrictions on hunting
○The effects of logging and fire
○Laws that protected feeding grounds of deer

Petroleum Resources

- Petroleum, consisting of crude oil and natural gas, seems to originate from organic matter in marine sediment. Microscopic organisms settle to the seafloor and accumulate in marine mud. The organic matter may partially decompose, using up the dissolved oxygen in the sediment. As soon as the oxygen is gone, decay stops and the remaining organic matter is preserved.
- Continued sedimentation—the process of deposits' settling on the sea bottom—buries the organic matter and subjects it to higher temperatures and pressures, which convert the organic matter to oil and gas. As muddy sediments are pressed together, the gas and small droplets of oil may be squeezed out of the mud and may move into sandy layers nearby. Over long periods of time (millions of years), accumulations of gas and oil can collect in the sandy layers. Both oil and gas are less dense than water, so they generally tend to rise upward through water-saturated rock and sediment.
- Oil pools are valuable underground accumulations of oil, and oil fields are regions underlain by one or more oil pools. When an oil pool or field has been discovered, wells are drilled into the ground. Permanent towers, called derricks, used to be built to handle the long sections of drilling pipe. Now-portable drilling machines are set up and are then dismantled and removed. When the well reaches a pool, oil usually rises up the well because of its density difference with water beneath it or because of the pressure of expanding gas trapped above it. Although this rise of oil is almost always carefully controlled today, spouts of oil, or gushers, were common in the past. Gas pressure gradually dies out, and oil is pumped from the well. Water or steam may be pumped down adjacent wells to help push the oil out. At a refinery, the crude oil from underground is separated into natural gas, gasoline, kerosene, and various oils. Petrochemicals such as dyes, fertilizer, and plastic are also manufactured from the petroleum.

- As oil becomes increasingly difficult to find, the search for it is extended into more-hostile environments. The development of the oil field on the North Slope of Alaska and the construction the Alaska pipeline are examples of the great expense and difficulty involved in new oil discoveries. Offshore drilling platforms extend the search for oil to the ocean's continental shelves—those gently sloping submarine regions at the edges of the continents. More than one-quarter of the world's oil and almost one-fifth of the world's natural gas come

from offshore, even though offshore drilling is six to seven times more expensive than drilling on land. A significant part of this oil and gas comes from under the North Sea between Great Britain and Norway. Of course, there is far more oil underground than can be recovered. It may be in a pool too small or too far from a potential market to justify the expense of drilling. Some oil lies under regions where drilling is forbidden, such as national parks or other public lands. Even given the best extraction techniques, only about 30 to 40 percent of the oil in a given pool can be brought to the surface. The rest is far too difficult to extract and has to remain underground.

- Of course, there is far more oil underground than can be recovered. It may be in a pool too small or too far from a potential market to justify the expense of drilling. Some oil lies under regions where drilling is forbidden, such as national parks or other public lands. Even given the best extraction techniques, only about 30 to 40 percent of the oil in a given pool can be brought to the surface. The rest is far too difficult to extract and has to remain underground.
- Moreover, getting petroleum out of the ground and from under the sea and to the consumer can create environmental problems anywhere along the line. Pipelines carrying oil can be broken by faults or landslides, causing serious oil spills. Spillage from huge oil-carrying cargo ships, called tankers, involved in collisions or accidental groundings (such as the one off Alaska in 1989) can create oil slicks at sea. Offshore platforms may also lose oil, creating oil slicks that drift ashore and foul the beaches, harming the environment. Sometimes, the ground at an oil field may subside as oil is removed. The Wilmington field near Long Beach, California, has subsided nine meters in 50 years; protective barriers have had to be built to prevent seawater from flooding the area. Finally, the refining and burning of petroleum and its products can cause air pollution. Advancing technology and strict laws, however, are helping control some of these adverse environmental effects.

1. The word "accumulate" in the passage is closest in meaning to

○grow up ○build up ○spread out ○break apart

2. According to paragraph 1, which of the following is true about petroleum formation?

○Microscopic organisms that live in mud produce crude oil and natural gas.

○Large amounts of oxygen are needed for petroleum formation to begin.
○Petroleum is produced when organic material in sediments combines with decaying marine organisms.

○Petroleum formation appears to begin in marine sediments where organic matter is present.

3. In paragraphs 1 and 2, the author's primary purpose is to

○describe how petroleum is formed

○explain why petroleum formation is a slow process

○provide evidence that a marine environment is necessary for petroleum formation

○show that oil commonly occurs in association with gas

5. The word "adjacent" in the passage is closest in meaning to

○nearby ○existing ○special ○deep

6. Which of the following can be inferred from paragraph 3 about gushers?

○They make bringing the oil to the surface easier.

○They signal the presence of huge oil reserves.

○They waste more oil than they collect.

○They are unlikely to occur nowadays.

7. Which of the following strategies for oil exploration is described in paragraph 4?

○Drilling under the ocean's surface

○Limiting drilling to accessible locations

○Using highly sophisticated drilling equipment

○Constructing technologically advanced drilling platforms

8. What does the development of the Alaskan oil field mentioned in paragraph 4 demonstrate?

○More oil is extracted from the sea than from land.

○Drilling for oil requires major financial investments.

○The global demand for oil has increased over the years.

○The North Slope of Alaska has substantial amounts of oil.

9. The word "sloping" in the passage is closest in meaning to

○shifting ○inclining ○forming ○rolling

10. According to paragraph 5, the decision to drill for oil depends on all of the following factors EXCEPT

○permission to access the area where oil has been found

○the availability of sufficient quantities of oil in a pool

○the location of the market in relation to the drilling site

○the political situation in the region where drilling would occur

11. The word "foul" in the passage is closest in meaning to

○reach ○flood ○pollute ○alter

12. In paragraph 6, the author's primary purpose is to

○provide examples of how oil exploration can endanger the environment

○describe accidents that have occurred when oil activities were in progress

○give an analysis of the effects of oil spills on the environment

○explain how technology and legislation help reduce oil spills

Week 5
Inference Questions

Necessary Skills

- Perceiving ideas that are suggested but not directly stated within a passage
- Drawing conclusions based on information given within a statement or section of a passage
- Determining logical implications of the author's words

Example Questions

• Which of the following can be inferred about…..?
• The author of the passage implies that….?
• Which of the following can be inferred from paragraph X about……?
• Based on information in paragraphs X and Y, what can be inferred about……?
• It is suggested in paragraph X that……

Strategies

• Ensure that your answer does not contradict the main idea of the passage.
• Do not choose an answer because it seems important or true. The correct answer must be inferable from the passage.
• Check that you can defend your answer choice by referring to explicitly stated information in the passage that points to the inference you have chosen.

TPO5

Minerals and Plants

- Research has shown that certain minerals are required by plants for normal growth and development. The soil is the source of these minerals, which are absorbed by the plant with the water from the soil. Even nitrogen, which is a gas in its elemental state, is normally absorbed from the soil as nitrate ions. Some soils are notoriously deficient in micro nutrients and are therefore unable to support most plant life. So-called serpentine soils, for example, are deficient in calcium, and only plants able to tolerate low levels of this mineral can survive. In modern agriculture, mineral depletion of soils is a major concern, since harvesting crops interrupts the recycling of nutrients back to the soil.

- Mineral deficiencies can often be detected by specific symptoms such as chlorosis (loss of chlorophyll resulting in yellow or white leaf tissues), necrosis (isolated dead patches), anthocyanin formation (development of deep red pigmentation of leaves or stem), stunted growth, and development of woody tissues in an herbaceous plant. Soils are most commonly deficient in nitrogen and phosphorus. Nitrogen-deficient plants exhibit many of the symptoms just described. Leaves develop chlorosis, stems are short and slender, and anthocyanin discoloration occurs on stems, petioles, and lower leaf surfaces. Phosphorus-deficient plants are often stunted, with leaves turning a characteristic dark green often with the accumulation of anthocyanin. Typically, older leaves are affected first as the phosphorus is mobilized to young growing tissue. Iron deficiency is characterized by chlorosis between veins in young leaves.

- Much of the research on nutrient deficiencies is based on growing plants hydroponically, that is, in soiless liquid nutrient solution. This technique allows researchers to create solutions that selectively omit certain nutrients and then observe the resulting effects on the plants. Hydroponics has applications beyond basic research, since it facilitates the growing of greenhouse vegetables, during winter. Aeroponics, a technique in which plants are suspended and the roots misted with a nutrient solution, is another method for growing plants without soil.

- While mineral deficiencies can limit the growth of plants, an overabundance of certain minerals can be toxic and can also limit growth. Saline soils, which have high concentrations of sodium chloride and other salts, limit plant growth, and research continues to focus on developing salt-tolerant varieties of agricultural crops. Research has focused on the toxic effects of heavy metals such as lead, cadmium, mercury and aluminum, however, even copper and zinc, which are essential elements, can become toxic in high concentrations. Although most plants cannot survive in these soils, certain plants have the ability to tolerate high levels of these minerals.
- Scientists have known for some time that certain plants, called hyperaccumulators, can concentrate minerals at levels a hundredfold or greater than normal. A survey of known hyperacculators identified that 75 percent of them amassed nickel, cobalt, copper,, zinc, manganese, lead, and cadmium are other minerals of choice. Hyperaccumulators run the entire range of the plant world. They may be herbs, shrubs, or trees. Many members of the mustard family, spurge family, legume family, and grass family are top hyperaccumulators. Many are found in tropical and subtropical areas of the world, where accumulation of high concentrations of metals may afford some protection against plant-eating insects and microbial pathogens.

- Only recently have investigators considered using these plants to clean up soil and waste sites that have been contaminated by toxic levels of heavy metals – an environmentally friendly approach known as phytoremediation. This scenario begins with the planting of hyperaccumulating species in the target area, such as an abandoned mine or an irrigation pond contaminated by runoff. Toxic minerals would first be absorbed by roots but later relocated to the stem and leaves. A harvest of the shoots would remove the toxic compounds off site to be burned or composted to recover the metal for industrial uses. After several years of cultivation and harvest, the site would be restored at a cost much lower than the price of excavation and reburial, the standard practice for remediation of contaminated soils. For example, in field trials, the plant alpine pennycress removed zinc and cadmium from soils near a zinc smelter, and Indian mustard, native to Pakistan and India, has been effective in reducing levels of selenium salts by 50 percent in contaminated soils.

1. According to paragraph 1, what is true of plants that can grow in serpentine soils? A) They absorb micronutrients unusually well.

B) They require far less calcium than most plants do.
C) They are able to absorb nitrogen in its elemental state.
D) They are typically crops raised for food.

2. The word exhibit in the passage is closest in meaning to

A) fight off
B) show
C) cause
D) spread

3. According to paragraph 2, which of the following symptoms occurs in phosphorous-deficient plants but not in plants deficient in nitrogen or iron?

A) Chlorosis on leaves.
B) Change in leaf pigmentation to dark shade of green.
C) Short, stunted appearance of stems.
D) Reddish pigmentation on the leaves or stem.

4. According to paragraph 2, a symptom of iron deficiency is the presence in young leaves of

A) deep red discoloration between the veins
B) white or yellow tissue between the veins
C) dead spots between the veins.
D) Characteristic dark green veins

5. The word facilitates in the passage is closest in meaning to

A) slows down
B) affects
C) makes easier
D) focuses on

6. According to paragraph 3, what is the advantage of hydroponics for research on nutrient deficiencies in plants?

A) It allows researchers to control what nutrients a plant receives.
B) It allows researchers to observe the growth of a large number of plants simultaneously.
C) It is possible to directly observe the roots of plants.
D) It is unnecessary to keep misting plants with nutrient solutions.

7. The word suspended in the passage is closest in meaning to

A) grown
B) protected
C) spread out
D) hung

8. Why does the author mention herbs, shrubs and trees?

A) To provide examples of plant types that cannot tolerate high levels of harmful minerals.
B) To show why so many plants are hyperaccumulators.
C) To help explain why hyperaccumulators can be found in so many different places.
D) To emphasize that hyperaccumulators occur in a wide range of plant types.

9. The word afford in the passage is closest in meaning to

A) offer
B) prevent
C) increase
D) remove

11. In can be inferred from paragraph 6 that compared with standard practices for remediation of contaminated soils, phytoremeidation

A) does not allow for the use of the removed minerals for industrial purposes
B) can be faster to implement
C) is equally friendly to the environment
D) is less suitable for soils that need to be used within a short period of time

12. Why does the author mention Indian mustard?

A) To warn about possible risks involved in phytoremediation.
B) To help illustrate the potential of phytoremediation.
C) To show that hyperaccumulating plants grow in many regions of the world.
D) To explain how zinc contamination can be reduced.

The Origin of the Pacific Island People

- The greater Pacific region, traditionally called Oceania, consists of three cultural areas: Melanesia, Micronesia, and Polynesia. Melanesia, in the southwest Pacific, contains the large islands of New Guinea, the Solomons, Vanuatu, and New Calodonia. Mircronesia, the area north of Melanesia, consists primarily of small scattered islands. Polynesia is the central Pacific area in the great triangle defined by Hawaii, Easter Island, and New Zealand. Before the arrival of Europeans, the islands in the two largest cultural areas, Polynesia and Micronesia, together contained a population estimated at 700,000.

- Speculation on the origin of these Pacific islanders began as soon as outsiders encountered them, in the absence of solid linguistic, archaeological, and biological data, many fanciful and mutually exclusive theories were devised. Pacific islanders were variously thought to have come from North America, South America, Egypt, Israel, and India, as well as Southeast Asia. Many older theories implicitly deprecated the navigational abilities and overall cultural creativity of the Pacific islanders. For example, British anthropologists G. Elliot Smith and W. J. Perry assumed that only Egyptians would have been skilled enough to navigate and colonize the Pacific. They inferred that the Egyptians even crossed the Pacific to found great civilizations of the New World (North and South America). In 1947, Norwegian adventurer Thor Heyerdahl drifted on a balsa-log raft westward with the winds and currents across the Pacific from South America to prove his theory that Pacific islanders were Native Americans (also called American Indians). Later Heyerdahl suggested that the Pacific was peopled by three migrations: by Native Americans from the Pacific Northwest of North America drifting to Hawaii, by Peruvians drifting to Easter Island, and by Melanesians. In 1969 he crossed the Atlantic in an Egyptian-style reed boat to prove Egyptian influences in the Americas. Contrary to these theorists, the overwhelming evidence of physical anthropology, linguistics, and archeology shows that the Pacific islanders came from Southwest Asia and were skilled enough as navigators to sail against the prevailing winds and currents.

- The basic cultural requirements for the successful colonization of the Pacific islands include the appropriate boat-building, sailing, and navigation skills to get to the islands in the first place, domesticated plants and gardening skills suited to often marginal conditions, and a varied inventory of fishing implements and techniques. It is now generally believed that these prerequisites originated with peoples speaking Austronesian languages (a group of several hundred related languages) and began to emerge in Southwest Asia by about 5000 B.C.E. The culture of that time, based on archaeology and linguistic reconstruction, is assumed to have had a broad inventory of cultivated plants including taro, yams, banana, sugarcane, breadfruit, coconut, sago, and rice. Just as important, the culture also possessed the basic foundation for an effective maritime adaptation including outrigger canoes and a variety of fishing techniques that could be effective for overseas voyaging.

- Contrary to the arguments of some that much of the Pacific was settled by Polynesians accidentally marooned after being lost and adrift, it seems reasonable that this feat was accomplished by deliberate colonization expeditions that set out fully stocked with food and domesticated plants and animals. Detailed studies of the winds and currents using computer simulations suggest that drifting canoes would have been a most unlikely means of colonizing the Pacific. These expeditions were likely driven by population growth and political dynamics on the home islands, as well as the challenge and excitement of exploring unknown waters. Because all Polynesians, Micronesians, and many Melanesians speak Austronesian languages and grow crops derived from Southwest Asia, all these peoples most certainly derived from that region and not the New World or elsewhere. The undisputed pre-Columbian presence in Oceania of the sweet potato, which is a New World domesticate, has sometimes been used to support Heyerdahl's "American Indians in the Pacific" theories. However, this is one plant out of a long list of Southwest Asian domesticates. As Patrick Kirch, an American anthropologist, points out, rather than being brought by rafting South Americans, sweet potatoes might just have easily been brought back by returning Polynesian navigators who could have reached the west coast of South America.

1.According to paragraph 1, all of the following are true statements about Melanesia, Micronesia, and Polynesia EXCEPT

A) Collectively, these regions are traditionally known as Oceania.
B) The islands of Micronesia are small and spread out.
C) Hawaii, Easter Island, and New Zealand mark the boundaries of Polynesia.
D) Melanesia is situated to the north of Micronesia.

2. By stating that the theories are "mutually exclusive" the author means that

A) if one of the theories is true, then all the others must be false
B) the differences between the theories are unimportant
C) taken together, the theories cover all possibilities
D) the theories support each other

3. The word overwhelming in the passage is closest in meaning to

A) powerful
B) favorable
C) current
D) reasonable

4. According to paragraph 2, which of the following lad some early researchers to believe that the Pacific islanders originally came from Egypt?

A) Egyptians were known to have founded other great civilization.
B) Sailors from other parts of the world were believed to lack the skills needed to travel across the ocean.
C) Linguistic, archaeological, and biological data connected the islands to Egypt.
D) Egyptian accounts claimed responsibility for colonizing the Pacific as well as the Americas.

5. Which of the following can be inferred from paragraph 2 about early theories of where the first inhabitants of the Pacific islands came from?

A) They were generally based on solid evidence.

B) They tend to account for the origin of the characteristic features of the language spoken by Pacific islanders.

C) They assume that the peoples living in Southwest Asia did not have the skills needed to sail to the Pacific islands.

D) They questioned the ideas of G. Elliot Smith and W. J. Perry.

6. The word implements in the passage is closest in meaning to

A) skills

B) tools

C) opportunities

D) practices

7. All of the following are mentioned in paragraph 3 as required for successful colonization of the Pacific islands EXCEPT

A) knowledge of various Austronesian languages

B) a variety of fishing techniques

C) navigational skills

D) knowledge of plant cultivation

8. In paragraph 3, why does the author provide information about the types of crops grown and boats used in Southwest Asia during the period around 5000 B.C.E.?

A) To evaluate the relative importance of agriculture and fishing to early Austronesian peoples.

B) To illustrate the effectiveness of archaeological and linguistic methods in discovering details about life in ancient times.

C) To contrast living conditions on the continent of Asia with living conditions on the Pacific islands.

D) To demonstrate that people from this region had the skills and resources necessary to travel to and survive on the Pacific islands.

9. The word undisputed in the passage is closet in meaning to

A) mysterious

B) unexpected

C) acknowledged

D) significant

10. According to paragraph 4, which of the following is NOT an explanation for why a group of people might have wanted to colonize the Pacific islands?

A) As their numbers increased, they needed additional territory.

B) The winds and currents made the islands easy to reach.

C) The political situation at home made emigration desirable.

D) They found exploration challenging and exciting.

12. Why does the author mention the views of Patrick Kirch?

A) To present evidence in favor of Heyerdahl's idea about American Indians reaching Oceania.
B) To emphasize the familiarity of Pacific islanders with crops from many different regions of the world.
C) To indicate that a supposed proof for Heyerdahl's theory has an affirmative explanation.
D) To demonstrate that some of the same crops were cultivated in both South America and Oceania.

The Cambrian Explosion

- The geologic timescale is marked by significant geologic and biological events, including the origin of Earth about 4.6 billion years ago, the origin of life about 3.5 billion years ago, the origin of eukaryotic life-forms (living things that have cells with true nuclei) about 1.5 billion years ago, and the origin of animals about 0.6 billion years ago. The last event marks the beginning of the Cambrian period. Animals originated relatively late in the history of Earth—in only the last 10 percent of Earth's history. During a geologically brief 100-million-year period, all modern animal groups (along with other animals that are now extinct) evolved. This rapid origin and diversification of animals is often referred to as "the Cambrian explosion".
- Scientists have asked important questions about this explosion for more than a century. Why did it occur so late in the history of Earth? The origin of multicellular forms of life seems a relatively simple step compared to the origin of life itself. Why does the fossil record not document the series of evolutionary changes during the evolution of animals? Why did animal life evolve so quickly? Paleontologists continue to search the fossil record for answers to these questions.
- One interpretation regarding the absence of fossils during this important 100-million-year period is that early animals were soft bodied and simply did not fossilize. Fossilization of soft-bodied animals is less likely than fossilization of hard-bodied animals, but it does occur. Conditions that promote fossilization of soft-bodied animals include very rapid covering by sediments that create an environment that discourages decomposition. In fact, fossil beds containing soft-bodied animals have been known for many years.
- The Ediacara fossil formation, which contains the oldest known animal fossils, consists exclusively of soft-bodied forms. Although named after a site in Australia, the Ediacara formation is worldwide in distribution and dates to Precambrian times. This 700-million-year-old formation gives few clues to the origins of modern animals, however, because paleontologists believe it represents an evolutionary experiment that failed. It contains no ancestors of modern animal groups.
- A slightly younger fossil formation containing animal remains is the Tommotian formation, named after a locale in Russia. It dates to the very early Cambrian period, and it also contains only soft-bodied forms. At one time, the animals present in these fossil beds were assigned to various modern animal groups, but most paleontologists now agree that all Tommotian fossils represent unique body forms that arose in the early Cambrian period and disappeared before the end of the period, leaving no descendants in modern animal groups.
- A third fossil formation containing both soft-bodied and hard-bodied animals provides evidence of the result of the Cambrian explosion. This fossil formation, called the Burgess Shale, is in Yoho National Park in the Canadian Rocky Mountains of British Columbia. Shortly after the Cambrian explosion, mud slides rapidly buried thousands of marine animals

under conditions that favored fossilization. These fossil beds provide evidence of about 32 modern animal groups, plus about 20 other animal body forms that are so different from any modern animals that they cannot be assigned to any one of the modern groups. These unassignable animals include a large swimming predator called Anomalocaris and a soft-bodied animal called Wiwaxia, which ate detritus or algae. The Burgess Shale formation also has fossils of many extinct representatives of modern animal groups. For example, a well-known Burgess Shale animal called Sidneyia is a representative of a previously unknown group of arthropods (a category of animals that includes insects, spiders, mites, and crabs). Fossil formations like the Burgess Shale show that evolution cannot always be thought of as a slow progression. The Cambrian explosion involved rapid evolutionary diversification, followed by the extinction of many unique animals. Why as this evolution so rapid? No one really knows. Many zoologists believe that it was because so many ecological niches were available with virtually no competition from existing species. Will zoologists ever know the evolutionary sequences in the Cambrian explosion? Perhaps another ancient fossil bed of soft-bodied animals from 600-million-year-old seas is awaiting discovery.

1. The word "significant" in the passage is closest in meaning
O numerous
O important
O unexplained
O sudden

2. The word "relatively" in the passage is closest in meaning to
O surprisingly
O collectively
O comparatively
O characteristically

3. The word "diversification" in the passage is closest in meaning to
O emergence of many varieties
O steady decline in number
O gradual increase in body size
O sudden disappearance

4. The period discussed in the passage is referred to as an "explosion" because it
O occurred 0.6 billion years ago, late in Earth's history
O was characterized by the unusually fast evolution of many new life-forms
O was characterized by widespread animal extinction
O was characterized by violent volcanic eruptions

5. According to paragraph 2, which of the following is NOT a question that paleontologists asked about the Cambrian explosion?
O Why was the origin of life a simple step in Earth's history?
O Why did it take so long for multicellular organisms to develop?
O Why did animal life evolve so rapidly?
O Why does the fossil record lack evidence of animal evolution during that time?

6. Which of the following best describes the relationship between paragraph 2 and paragraph 3?
O Paragraph 2 puts forward several scientific claims, one of which is rejected in paragraph 3.
O Paragraph 2 poses several questions, and paragraph 3 offers a possible answer to one of them.
O Paragraph 2 presents outdated traditional views, while paragraph 3 presents the current scientific conclusions.
O Paragraph 2 introduces a generalization that is illustrated by specific examples in paragraph 3.

7. The word "promote" in the passage is closest in meaning
O complicate
O prevent
O encourage
O affect

8. Which of the following is NOT mentioned in paragraph 4 as being true of the Ediacara formation?
O It contains fossils that date back to the Precambrian period.
O It contains only soft-bodied animal fossils.
O It is located on a single site in Australia.
O It does not contain any fossils of the ancestors of modern animals.

9. Why does the author mention "Anomalocaris" and "Wiwaxia"?
O To contrast predators with animals that eat plants such as algae
O To question the effects of rapid mud slides on fossilization
O To suggest that much is still unknown about animals found in the Burgess Shale
O To provide examples of fossils that cannot be assigned to a modern animal group

10. "Sidneyia" is an example of
O a relative of Anomalocaris and Wiwaxia
O a previously unknown Burgess Shale animal
O an extinct member of a currently existing category of animals
O an animal that cannot be assigned to any modem animal group

11. What can be inferred from paragraph 7 about why the Cambrian explosion is so unusual?
O It generated new ecological niches through the extinction of many unique animals.
O It was a period of rapid evolution, and evolution is often thought of as a slow process.
O It is a period whose evolutionary sequences are clearly marked.
O It generated a very large number of ancient fossil beds containing soft-bodied animals.

Week 6
Restatement Questions

You will see two or three sentence restatement questions in the Reading Section. This type of question presents a sentence from the passage and then asks you to choose the sentence that best restates or summarizes the information in the original sentence. The correct choice will not look like the original sentence. It will use different grammar and different vocabulary, substituting synonyms for words in the original sentence. The special directions that are given for these questions tell you that you have to select the choice that has the essential information that is in the original sentence. The directions also tell you that incorrect choices omit important information from the original sentence or change the meaning of the original sentence. To find correct choices, you must identify the sentence that summarizes or simplifies the information in the sentence from the passage. In other words, a choice that eliminates details and examples from the original sentence may be a correct answer as long as it does not leave out important information.

When you answer sentence restatement questions, ask yourself, "What is the important idea or ideas in the sentence?" (there may be two or three). Then read the four choices. If the choice changes the meaning of the original, or does not express the main idea(s) completely, it is not the right choice. Remember: The right choice has the same meaning as the original sentence, but it may simplify and summarize the original sentence. It may not omit important information.

TPO6

Powering the Industrial Revolution

- In Britain, one of most dramatic changes of the Industrial Revolution was the harnessing of power. Until the reign of George lll (1760-1820), available sources of power for work and travel had not increased since the Middle Ages. There were three sources of power, animal or human muscles; the wind, operating on sail or windmill; and running water. Only the last of these was suited at all to the continuous operating of machines, and although waterpower abounded in Lancashire and Scotland and ran grain mills as well as textile mills, it had one great disadvantage: Streams flowed where nature intended them to, and water-driven factories had to be located on their banks, whether or not the location was desirable for other reasons. Furthermore, even the most reliable waterpower varied with the seasons and disappeared in a drought. The new age of machinery, in short, could not have been born without a new source of both movable and constant power.

- The source had long been known but not exploited. Early in the century, a pump had come into use in which expanding steam raised a piston in a cylinder, and atmospheric pressure brought it down again when the steam condensed inside the cylinder to form a vacuum. This "atmospheric engine", invented by Tomas Savey and vastly improved by his partner Thomas Newcomen, embodied revolutionary principles, but it was so slow and wasteful of fuel that it could not be employed outside the coal mines for which it had been designed. In the 1760s, James Watt perfected a separate condenser for the steam, so that the cylinder did not have to be cooled at every stroke; then he devised a way to make the piston turn a wheel and thus convert reciprocating (back and forth) motion into rotary motion. He thereby transformed an inefficient pump of limited use into a steam engine of a thousand uses. The final step came when steam was introduced into the cylinder to drive the piston background as well as forward, thereby increasing the speed of the engine and cutting its fuel consumption.

- Watt's steam engine soon showed what it could do. It liberated industry from dependence on running water. The engine eliminated water in the mines by driving efficient pumps, which made possible deeper and deeper mining. The ready availability of coal inspired William Murdoch during the 1790s to develop the first new form of nighttime illumination to be discovered in a millennium and a half. Coal gas rivaled smoky oil lamps and flickering candles, and early in the new century, well-to-do Londoners grew accustomed to gaslit houses and even streets. Iron manufacturers, which had starved for fuel while depending on charcoal, also benefited from ever-increasing supplies of coal: blast furnaces with steam-powered bellows turned out more iron and steel for the new machinery. Steam became the motive force of the Industrial Revolution, as coal and iron ore were the raw materials.

- By 1800 more than a thousand steam engines were in use in the British Isles, and Britain retained a virtual monopoly on steam engine production until the 1830s. Steam power did not merely spin cotton and roll iron; early in the new century, it also multiplied ten times over the amount of paper that a single worker could produce in a day. At the same time, operators of the first printing presses run by steam rather than by hand found it possible to produce a thousand pages in an hour rather than thirty. Steam also promised to eliminate a transportation problem not fully solved by either canal boats or turnpikes. Boats could carry heavy weights, but canals could not cross hilly terrain; Turnpikes could cross the hills, but the roadbeds could not stand up under great weights. These

problems needed still another solution, and the ingredients for it lay close at hand. In some industrial regions, heavily laden wagons, with flanged wheels, were being hauled by horses along metal rails: and the stationary steam engine was puffing in the factory and mine. Another generation passed before inventors succeeded in combining these ingredients, by putting the engine on wheels and the wheels on the rails, so as to provide a machine to take the place of the horse. Thus the railroad age sprang from what had already happened in the eighteenth century.

1 Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A Running water was the best power source for factories since it could keep machines operating continuously, but since it was abundant only in lancashire and Scotland, most mills and factories that were located elsewhere could not be water driven.
B The disadvantage of using water power is that streams do not necessarily flow in places that are the most suitable for factories, which explains why so many water-power grain and textile mills were located in undesirable places.
C Since machines could be operated continuously only where running water was abundant, grain and textile mills, as well as other factories, tended to be located only in lancashire and Scotland.
D Running water was the only source of power that was suitable for the continuous operation of machines, but to make use of it, factories had to be located where the water was, regardless of whether such locations made sense otherwise.

2 Which of the following best describes the relation of paragraph 2 to paragraph 1?

Aparagraph 2 shows how the problem discussed in paragraph 1 arose.
Bparagraph 2 explains how the problem presented in paragraph 1 came to be solved.
Cparagraph 2 provides a more technical discussion of the problem introduced in paragraph 1.
Dparagraph 2 shows why the problem discussed in paragraph 1 was especially important to solve.

3 The word " exploited " in the passage is closest in meaning to

A utilized
B recognized
C examined
D fully understood

4 The word " vastly "in the passage is closest in meaning to

A quickly
B ultimately
C greatly
D initially

5. According to paragraph 2, the "atmospheric engine" was slow because

A It had been designed to be used in coal mines
B The cylinder had to cool between each stroke
C It made use of expanding steam to raise the piston in its cylinder
D It could be operated only when a large supply of fuel was available

6 According to paragraph 2, Watt' s steam engine differed from earlier steam engines in each of the following ways EXCEPT:

A It used steam to move a piston in a cylinder.
B It worked with greater speed.
C It was more efficient in its use of fuel.
D It could be used in many different ways.

7 In paragraph 3, the author mentions William Murdoch's invention of a new form of nighttime illumination in order to

A indicate one of the important developments made possible by the introduction of Watt's steam engine.
B make the point that Watt's steam engine was not the only invention of importance to the Industrial Revolution
C illustrate how important coal was as a raw material for the Industrial Revolution
D provide an example of another eighteenth- century invention that used steam as a power source

8 The phrase " grew accustomed to " in the passage is closest in meaning to

Abegan to prefer
Bwanted to have
Cbecame used to
Dinsisted on

9 The word " retained " in the passage is closest in meaning to

A gained
B established
C profited from
D maintained

10 According to paragraph 4, which of the following statements about steam engines is true?
A they were used for the production of paper but not for printing.
B by 1800, significant numbers of them were produced outside of Britain.
C they were used in factories before they were used to power trains.
D they were used in the construction of canals and turnpikes.

11 According to paragraph 4, providing a machine to take the place of the horse involved combining which two previously separate ingredients?

A turnpikes and canals
B stationary steam engines and wagons with flanged wheels
C metal rails in roadbeds and wagons capable of carrying heavy loads
D Canal boats and heavily laden wagons

William Smith

- In 1769 in a little town in Oxfordshire, England, a child with the very ordinary name of William Smith was poor into the poor family of a village backsmith. He received rudimentary village schooling, but mostly he roamed his uncle's farm collecting the fossils that were so abundant in the rocks of the Cotswold hills. When he grew older, William Smith taught himself surveying from books he bought with his small savings, and at the end of eighteen he was apprenticed to a surveyor of the local parish. He then proceeded to teach himself geology, and when he was twenty-four, he went to work for the company that was excavating the Somerset Coal Canal in the south of England.

- This was before the steam locomotive, and canal building was at its height. The companies building the canals to transport coal needed surveyors to help them find the coal deposits worth mining as well as to determine the best courses for the canals. This job gave Smith an opportunity to study the fresh rock outcrops created by the newly dug canal. He later worked on similar jobs across the length and breadth of England, all the while studying the newly revealed strata and collecting all the fossils he could find. Smith used mail coaches to travel as much as 10,000 miles per year. In 1815 he published the first modern geological map, " A map of the Strata of England and Wales with a part of Scotland, " a map so meticulously researched that it can still be used today.

- In 1831 when Smith was finally recognized by the Geological Society of London as the "father of English geology," it was not only for his maps but also for something even more important. Ever since people had begun to catalog the strata in particular outcrops, there had been the hope that these could somehow be used to calculate geological time. But as more and more accumulations of strata were cataloged in more and more places, it became clear that the sequences of rocks sometimes differed from region to region and that no rock type was ever going to become a reliable time maker throughout the world. Even without the problem of regional differences, rocks present a difficulty as unique time makers. Quartz is quartz- a silicon ion surrounded by four oxygen ions-there's no difference at all between two-million-year-old Pleistocene quartz and Cambrian quartz created over 500 million years ago.

- As he collected fossils from strata throughout England, Smith began to see the fossils told a different story from the rocks. Particularly in the younger strata, the rocks were often so similar that he had trouble distinguishing the strata, but he never had trouble telling the fossils apart. While rock between two consistent strata might in one place be shale and in another sandstone, the fossils in that shale or sandstone were always the same. Some fossils endured through so many millions of years that they appear in many strata, but others occur only in a few strata, and a few species had their births and extinctions within one particular stratum. Fossils are thus identifying markers for particular periods in Earth's history.

- Not only could Smith identify rock strata by the fossils they contained, he could see a pattern emerging : certain fossils always appear in more ancient sediments, while others begin to be seen as the strata become more recent. By following the fossils, Smith was able to put all the strata of England's earth into relative temporal sequence. About the same time, Georges Cuvier made the same discovery while studying the rocks around Paris. Soon it was realized that this principle of faunal (animal) succession was valid not only in England or France but virtually everywhere. It was actually a principle of floral succession as well, because plants showed the same transformation through time as did fauna. Limestone may be found in the Cambrian or -300 million years later- in the Jurassic strata, but a trilobite- the ubiquitous marine arthropod that had its birth in the Cambrian- will never be found in Jurassic strata, not a dinosaur in the Cambrian.

1 The word " rudimentary" in the passage is closest in meaning to

A thorough
B strict
C basic
D occasional

2 According to paragraph 1, which of the following statements about William Smith is not true?

A Smith learned surveying by reading and by apprenticing for a local surveyor.
B Smith's family lived in a small English town and possessed little wealth.
C Smith learned about fossils from books he borrowed from his uncle.
D Smith eventually left his village to work on the excavation of an English Canal.

3 Which of the following can be inferred from paragraph 2 about canal building?

A Canals were built primarily in the south of England rather than in other regions.
B Canals building decreased after the steam locomotive was invented.
C Canal building made it difficult to study rock strata which often became damaged in the process.
D Canal builders hired surveyors like Smith to examine exposed rock strata.

4 According to paragraph 2, which of the following is true of the map published by William Smith?

A It indicates the locations of England's major canals.
B It became most valuable when the steam locomotive made rail travel possible.
C The date for the map were collected during Smith's work on canals.
D It is no longer regarded as a geological masterpiece.

5 The word "meticulously" in the passage is closest in meaning to

A carefully
B quickly
C frequently
D obviously

6 Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A The discovery of regional differences in the sequences of rocks led geologists to believe that rock types could some day become reliable time makers.
B Careful analysis of strata revealed that rocks cannot establish geological time because the pattern of rock layers varies from place to place.
C Smith's catalogs of rock strata indicated that the sequences of rocks are different from place to place and from region to region.
D Because people did not catalog regional differences in sequences of rocks, it was believed that rocks could never be reliable time markers.

7 Why does the author use the phrase" Quartz is quartz"?

A To describe how the differences between Pleistocene and Cambrian quartz reveal information about dating rocks
B To point out that the chemical composition of quartz makes it more difficult to date than other rocks
C To provide an example of how regional differences in rock sequences can make a particular rock difficult to date
D To explain the rocks are difficult to use for dating because their chemical composition always remain the same over time

8 According to paragraph 4, it was difficult for Smith to distinguish rock strata because

A the rocks from different strata closely resembled each other
B he was often unable to find fossils in the younger rock strata
C their similarity to each other made it difficult for him to distinguish one rock type from another
D the type of rock between two consistent strata was always the same

9 The word " endured " in the passage is closest in meaning to

A vanished
B developed
C varied
D survived

10 The word " virtually " in the passage is closest in meaning to

A possibly
B absolutely
C surprisingly
D nearly

11 Select the TWO answer choices that are true statements based upon the discussion of the principle of faunal succession in paragraph 5. To receive credit, you must select TWO answers.

A it was a principle that applied to fauna but not to flora
B it was discovered independently by two different geologists
C it described how fossils are distributed in rock strata
D it explains why plants and animals undergo transformations through time

12 In the mentioning " trilobite", the author is making which of the following points?

A Fossils cannot be found in more than on rock stratum
B Faunal succession can help put rock layers in relative temporal sequence
C Faunal succession cannot be applied to different strata composed of the same kind of rock
D The presence of trilobite fossils makes it difficult to date a rock

Infantile Amnesia

- What do you remember about your life before you were three? Few people can remember anything that happened to them in their early years. Adults' memories of the next few years also tend to be scanty. Most people remember only a few events-usually ones that were meaningful and distinctive, such as being hospitalized or a sibling's birth.

- How might this inability to recall early experiences be explained? The sheer passage of time does not account for it, adults have excellent recognition of pictures of people who attended high school with them 35 years earlier. Another seemingly plausible explanation-that infants do not form enduring memories at this point in development-also is incorrect. Children two and a half to three years old remember experiences that occurred in their first year, and eleven month olds remember some events a year later. Nor does the hypothesis that infantile amnesia reflects repression-or holding back-of sexually charged episodes explain the phenomenon. While such repression may occur, people cannot remember ordinary events from the infant and toddler periods, either.

- Three other explanations seem more promising. One involves physiological changes relevant to memory. Maturation of the frontal lobes of the brain continues throughout early childhood, and this part of the brain may be critical for remembering particular episodes in ways that can be retrieved later. Demonstrations of infants' and toddlers' long-term memory have involved their repeating motor activities that they had seen or done earlier, such as reaching in the dark for objects, putting a bottle in a doll's mouth, or pulling apart two pieces of a toy. The brain's level of physiological maturation may support these types of memories, but not ones requiring explicit verbal descriptions.

- A second explanation involves the influence of the social world on children's language use. Hearing and telling stories about events may help children store information in ways that will endure into later childhood and adulthood. Through hearing stories with a clear beginning, middle, and ending, children may learn to extract the gist of events in ways that they will be able to describe many years later. Consistent with this view, parents and children increasingly engage in discussions of past events when children are about three years old. However, hearing such stories is not sufficient for

younger children to form enduring memories. Telling such stories to two year olds does not seem to produce long-lasting verbalizable memories.

- A third likely explanation for infantile amnesia involves incompatibilities between the ways in which infants encode information and the ways in which older children and adults retrieve it. Whether people can remember an event depends critically on the fit between the way in which they earlier encoded the information and the way in which they later attempt to retrieve it. The better able the person is to reconstruct the perspective from which the material was encoded, the more likely that recall will be successful.

- This view is supported by a variety of factors that can create mismatches between very young children's encoding and older children's and adults' retrieval efforts. The world looks very different to a person whose head is only two or three feet above the ground than to one whose is five or six feet above it. Older children and adults often try to retrieve the names of things they saw, but infants would not have encoded the information verbally. General knowledge of categories of events such as a birthday party or a visit to the doctor's office helps older individuals encode their experiences, but again, infants and toddlers are unlikely to encode many experiences within such knowledge structures.

- These three explanations of infantile amnesia are not mutually exclusive: indeed, they support each other. Physiological immaturity may be part of my why infants and toddlers do not form extremely enduring memories, even when they hear stories that promote such remembering in preschoolers. Hearing the stories may lead preschoolers to encode aspects of events that allow them to form memories they can access as adults. Conversely, improved encoding of what they hear may help them better understand and remember stories and thus make the stories more useful for remembering future events. Thus, all three explanations -physiological maturation, hearing and producing stories about past events, and improved encoding of key aspects of events-seem likely to be involved in overcoming infantile amnesia.

1 What purpose does paragraph 2 serve in the larger discussion of children's inability to recall early experiences?

A To argue that theories that are not substantiated by evidence should generally be considered unreliable
B To argue that the hypotheses mentioned in paragraph 2 have been more thoroughly researched than have the theories mentioned later in the passage
C To explain why some theories about infantile amnesia are wrong before presenting ones more likely to be true
D To explain why infantile amnesia is of great interest to researchers

2 The word " plausible " in the passage is closest in meaning to
Aflexible
Bbelievable
Cdebatable
Dpredictable

3 The word " phenomenon " in the passage is closest in meaning to

A exception
B repetition
C occurrence
D idea

4 All of the following theories about the inability to recall early experiences are rejected in paragraph 2 EXCEPT

A The ability to recall an event decreases as the time after the event increases.
B Young children are not capable of forming memories that last for more than a short time.
C People may hold back sexually meaningful memories.
D Most events in childhood are too ordinary to be worth remembering.

5 What does paragraph 3 suggest about long-term memory in children?

A Maturation of the frontal lobes of the brain is important for the long-term memory of motor activities but not verbal descriptions.
B Young children may form long-term memories of actions they earlier than of things they hear or are told.
C Young children have better long-term recall of short verbal exchanges than of long ones.
D Children's long-term recall of motor activities increases when such activities are accompanied by explicit verbal descriptions.

6 According to paragraph 4, what role may storytelling play in forming childhood memories?

A it may encourage the physiological maturing of the brain
B it may help preschool children tell the difference between ordinary and unusual memories
C It may help preschool children retrieve memories quickly.
D It may provide an ordered structure that facilitates memory retrieval.

6 The word " critically" in the passage is closest in meaning to

A fundamentally
B partially
C consistently
D subsequently

7 The word " perspective "in the passage is closet in meaning to

A system
B theory
C source
D viewpoint

8 The phrase" This view " in the passage refers to the belief that

A the ability to retrieve a memory partly depends on the similarity between the encoding and retrieving process
B the process of encoding information is less complex for adults than it is for young adults and infants
C infants and older children are equally dependent on discussion of past events for the retrieval of information
D infants encode information in the same way older children and adults do

9 According to paragraph 5 and 6, one disadvantage very young children face in processing information is that they cannot

A process a lot of information at one time
B organize experiences according to type
C block out interruptions
D interpret the tone of adult language

10 Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A Incomplete physiological development may partly explain why hearing stories does not improve long-term memory infants and toddlers.
B One reason why preschoolers fail to comprehend the stories they hear is that they are physiologically immature.
C Given the chance to hear stories, infants and toddlers may form enduring memories despite physiological immaturity.
D Physiologically mature children seem to have no difficulty remembering stories they heard as preschoolers.

11 How does paragraph 7 relate to the earlier discussion of infantile amnesia?

AIt introduces a new theory about the causes of infantile amnesia.
BIt argues that particular theories discussed earlier in the passage require further research.
CIt explains how particular theories discussed earlier in the passage may work in combination.
DIt evaluates which of the theories discussed earlier is mostly like to be true.

Week 7

Sentence Addition/ Insertion Questions

Sentence addition questions tell you to look at a paragraph in the reading passage. In that paragraph, there are four black squares. You are given a sentence that is not in the passage and told to add it to the paragraph at one of the four places marked by the black squares. You must decide which of these four squares is the most logical place for the missing sentence. When you click on one of the squares, the sentence will appear at that point in the paragraph. Sentence addition questions test your understanding of correct sequencing, of paragraph organization, and especially of paragraph cohesion. You can think of cohesion as the "glue" that holds the sentences of a paragraph together. There are certain devices that writers use to achieve cohesion. You can sometimes use these devices as clues to help you find the best place to put the "new" sentence. You might see these devices either in the reading passage or in the new sentence.

Devices:

- ***Signal Words***

Scientists have many theories about why the Ice Ages took place. However, none of these theories can fully explain why ice sheets formed at certain periods and not at others.

The signal word However links these two sentences. It shows that there is a contrast between the information in the first sentence and the information in the second.

Stone tools are more durable than bones. Therefore, the tools of early humans are found more frequently than the bones of their makers.

These two sentences are joined by the signal word Therefore. This word indicates a conclusion. Because the information in the first sentence is true, the information in the second sentence also is true.

African art first came to the attention of Europeans around 1905 when art critics and artists recognized the dynamic qualities of African sculpture. Furthermore, some of the top European artists of the time, such as Picasso and Modigliani, used African art as inspiration for their own work.

These sentences are linked by the signal word Furthermore. This signal words indicates addition. The first sentence provides you with certain information about a topic (African art), and the second sentence provides you with more information on the same topic.

If we watch a cell divide under a microscope, what do we see? First, the nucleus of the cell begins to look different. The dense material then thins out in the middle. Finally, a new cell wall forms between the two nuclei. The cell has divided.

The signal words in this paragraph indicate sequence. They are used to link sentences that describe a series of events, or as in this paragraph, the steps of a process (cell division).

Here is a list of common signal words
Contrast>>>> however, on the other hand, nevertheless, unlike…., in contrast
Conclusion>>>> therefore, consequently, thus, hence
Addition>>>>furthermore, in addition, moreover
Sequence>>>>first, after that, afterwards, later, next, then, finally, lastly
Examples>>>>for example, for instance
Similarity>>>>similarly, likewise, like

- **Personal Pronouns**
  Blood travels through the great arteries. It then passes into smaller arteries until reaching the capillaries. They join to form veins, which carry the blood back to the heart.
  The pronoun *It* in the second sentence refers back to the referent blood in the first sentence, linking those two sentences. Likewise, the pronoun they in the third sentence refers back to capillaries in the second and links those two sentences.
- **Demonstratives**
  A number of methods of improving worker motivation and performance were developed in the l 970's. One of these was called Management by Objectives (MBO). This technique was designed to improve morale by having workers set their own goals.
  The demonstrative pronoun these links the second sentence to the first by referring back to the word methods. The phrase This technique links the third sentence with the second by referring back to the phrase Management by Objectives.
- **Synonyms**
  The earliest remains of ancient animals are those of soft-bodied jellyfish-like animals, worms, and proto-insects. The fossils of these creatures show us that, while some animals remained simple, others were becoming increasingly complex.
  These two sentences are linked by the word fossils, which is a synonym for remains.
- **Repetition of Key Words**
- Hydrilla is an invasive plant imported to Florida from Sri Lanka some fifty years ago to be used as a decorative plant in home aquariums. Hydrilla has overgrown more than 40% of the state's rivers and lakes, making life miserable for boaters and often impossible for native wildlife.
  The repetition of the key word hydrilla links these two sentences.

In addition to these language clues, you can also use content clues. The new sentence might be in contrast to one of the sentences in the passage. The new sentence might give an example of something mentioned in the passage, or it might represent a missing step in a process or a sequence of events. Remember: There must be some kind of key in either the passage or in the new sentence that links the new sentence to either the sentence that comes before the new sentence or the one that comes after it. There must be something-an idea, a word, a phrase-that tells you where to put the new sentence. It's up to you to find the clues!

Follow these steps when you answer a sentence addition question:

1. Read the new sentence carefully, then read the sentences in the paragraph that are marked with black squares as well as the sentences immediately before and after the black squares.

2. Look for signal words, personal pronouns, demonstratives, synonyms, and repeated words, first in the new sentence and then in the passage. Do any of these devices link the new sentence to any of the sentences before or after the black squares?

3. If the answer is not clear, look for content clues that could tie the new sentence to the sentence that comes before or after it.

4. Look for places in the passage where the focus seems to shift from one topic to another abruptly, without much transition.

5. You may be able to eliminate certain squares between two sentences because those sentences are closely joined and could not logically be separated. 6. If you still cannot find the answer, just go on to the next question and come back to this question later by means of the Review function.

TPO7

The Geologic History of the Mediterranean

- In 1970 geologists Kenneth J. Hsu and William B. F. Ryan were collecting research data while aboard the oceanographic research vessel Glomar Challenger. An objective of this particular cruise was to investigate the floor of the Mediterranean and to resolve questions about its geologic history. One question was related to evidence that the invertebrate fauna (animals without spines) of the Mediterranean had changed abruptly about 6 million years ago. Most of the older organisms were nearly wiped out, although a few hardy species survived. A few managed to migrate into the Atlantic. Somewhat later, the migrants returned, bringing new species with them. Why did the near extinction and migrations occur?

- Another task for the Glomar Challenger's scientists was to try to determine the origin of the domelike masses buried deep beneath the Mediterranean seafloor. These structures had been detected years earlier by echo-sounding instruments, but they had never been penetrated in the course of drilling. Were they salt domes such as are common along the United States Gulf Coast, and if so, why should there have been so much solid crystalline salt beneath the floor of the Mediterranean?

- With questions such as these clearly before them, the scientists aboard the Glomar Challenger proceeded to the Mediterranean to search for the answers. On August 23,1970, they recovered a sample. The sample consisted of pebbles of hardened sediment that had once been soft, deep-sea mud, as well as granules of gypsum and fragments of volcanic rock. Not a single pebble was found that might have indicated that the pebbles came from the nearby continent. In the days following, samples of solid gypsum were repeatedly brought on deck as drilling operations penetrated the seafloor. Furthermore, the gypsum was found to possess peculiarities of composition and structure that suggested it had formed on desert flats. Sediment above and below the gypsum layer contained tiny marine fossils, indicating open-ocean conditions. As they drilled into the central and deepest part of the Mediterranean basin, the scientists took solid, shiny, crystalline salt from the core barrel. Interbedded with the salt were thin layers of what appeared to be windblown silt.

- The time had come to formulate a hypothesis. The investigators theorized that about 20 million years ago, the Mediterranean was a broad seaway linked to the Atlantic by two narrow straits. Crustal movements closed the straits, and the landlocked Mediterranean began to evaporate. Increasing salinity caused by the evaporation resulted in the extermination of scores of invertebrate species. Only a few organisms especially tolerant of very salty conditions remained. As evaporation continued, the remaining brine (salt water) became so dense that the calcium sulfate of the hard layer was precipitated. In the central deeper part of the basin, the last of the brine evaporated to precipitate more soluble sodium chloride (salt). Later, under the weight of overlying sediments, this salt flowed plastically upward to form salt domes. Before this happened, however, the Mediterranean was a vast desert 3,000 meters deep. Then, about 5.5 million years ago came the deluge. As a result of crustal adjustments and faulting, the Strait of Gibraltar, where the Mediterranean now connects to the Atlantic, opened, and water cascaded spectacularly back into the Mediterranean. Turbulent waters tore into the hardened salt flats, broke them up, and ground them into the pebbles observed in the first sample taken by the Challenger. As the basin was refilled, normal marine organisms returned. Soon layers of oceanic ooze began to accumulate above the old hard layer.

- The salt and gypsum, the faunal changes, and the unusual gravel provided abundant evidence that the Mediterranean was once a desert

1. **The word "objective" in the passage is closest in meaning to**

O achievement
O requirement
O purpose
O feature

2. **Which of the following is NOT mentioned in paragraph 1 as a change that occurred in the fauna of the Mediterranean?**

O Most invertebrate species disappeared during a wave of extinctions
O A few hardy species wiped out many of the Mediterranean' s invertebrates O Some invertebrates migrated to the Atlantic Ocean.
O New species of fauna populated the Mediterranean when the old migrants returned

3. **What does the author imply by saying " Not a single pebble was found that might have indicated that the pebbles came from the nearby continent"?**

O The most obvious explanation for the origin of the pebbles was not supported by the evidence
O The geologists did not find as many pebbles as they expected.
O The geologists were looking for a particular kind of pebble
O The different pebbles could not have come from only one source.

4. **Which of the following can be inferred from paragraph 3 about the solid gypsum layer?**

O It did not contain any marine fossils.
O It had formed in open-ocean conditions.
O It had once been soft, deep-sea mud
O It contained sediment from nearby deserts.

5. **Select the TWO answer choices from paragraph 3 that identify materials discovered in the deepest part of the Mediterranean basin. To receive credit you must select TWO answers**

O Volcanic rock fragments
O Thin silt layers
O Soft, deep-sea mud
O Crystalline salt

6. **What is the main purpose of paragraph 3?**

O To describe the physical evidence collected by Hsu and Ryan
O To explain why some of the questions posed earlier in the passage could not be answered by the findings of the Glomar Challenger
O To evaluate techniques used by Hsu and Ryan to explore the sea floor
O To describe the most difficult problems faced by the Glomar Challenger expedition

7. According to paragraph 4, which of the following was responsible for the evaporation of the Mediterranean' s waters?

O The movements of Earth's crust
O The accumulation of sediment layers
O Changes in the water level of the Atlantic Ocean
O Changes in Earth' s temperature

8. The word "scores" in the passage is closest in meaning to

O members
O large numbers
O populations
O different types

9. According to paragraph 4, what caused most invertebrate species in the Mediterranean to become extinct?

O The evaporation of chemicals necessary for their survival
O Crustal movements that connected the Mediterranean to the saltier Atlantic
O The migration of new species through the narrow straits
O Their inability to tolerate the increasing salt content of the Mediterranean

10. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

O The Strait of Gibraltar reopened when the Mediterranean and the Atlantic became connected and the cascades of water from one sea to the other caused crustal adjustments and faulting

O The Mediterranean was dramatically refilled by water from the Atlantic when crustal adjustments and faulting opened the Strait of Gibraltar, the place where the two seas are joined.

O The cascades of water from the Atlantic to the Mediterranean were not as spectacular as the crustal adjustments and faulting that occurred when the Strait of Gibraltar was connected to those seas.

O As a result of crustal adjustments and faulting and the creation of the Strait of Gibraltar, the Atlantic and Mediterranean were connected and became a single sea with spectacular cascades of water between them.

11. The word "Turbulent" in the passage is closest in meaning to

O fresh
O deep
O violent
O temperate

12. Look at the four squares ■ indicate where the following sentence could be added to the passage.

Thus, scientists had information about the shape of the domes but not about their chemical composition and origin. Where would the sentence best fit?

Click on a square [■] to add the sentence to the passage

■Another task for the Glomar Challenger's scientists was to try to determine the origin of the domelike masses buried deep beneath the Mediterranean seafloor. ■ These structures had been detected years earlier by echo-sounding instruments, but they had never been penetrated in the course of drilling. ■Were they salt domes such as are common along the United States Gulf Coast, and if so, why should there have been so much solid crystalline salt beneath the floor of the Mediterranean? ■

Ancient Rome and Greece

- There is a quality of cohesiveness about the Roman world that applied neither to Greece nor perhaps to any other civilization, ancient or modem. Like the stones of a Roman wall, which were held together both by the regularity of the design and by that peculiarly powerful Roman cement, so the various parts of the Roman realm were bonded into a massive, monolithic entity by physical, organizational, and psychological controls. The physical bonds included the network of military garrisons, which were stationed in every province, and the network of stone-built roads that linked the provinces with Rome. The organizational bonds were based on the common principles of law and administration and on the universal army of officials who enforced common standards of conduct. The psychological controls were built on fear and punishment—on the absolute certainty that anyone or anything that threatened the authority of Rome would be utterly destroyed.

- The source of the Roman obsession with unity and cohesion may well have lain in the pattern of Rome's early development. Whereas Greece had grown from scores of scattered cities, Rome grew from one single organism. While the Greek world had expanded along the Mediterranean sea lanes, the Roman world was assembled by territorial conquest. Of course, the contrast is not quite so stark: in Alexander the Great the Greeks had found the greatest territorial conqueror of all time; and the Romans, once they moved outside Italy, did not fail to learn the lessons of sea power. Yet the essential difference is undeniable. The key to the Greek world lay in its high-powered ships; the key to Roman power lay in its marching legions. The Greeks were wedded to the sea; the Romans, to the land. The Greek was a sailor at heart; the Roman, a landsman.

- Certainly, in trying to explain the Roman phenomenon, one would have to place great emphasis on this almost animal instinct for the territorial imperative. Roman priorities lay in the organization,

exploitation, and defense of their territory. In all probability it was the fertile plain of Latium, where the Latins who founded Rome originated, that created the habits and skills of landed settlement, landed property, landed economy, landed administration, and a land-based society. From this arose the Roman genius for military organization and orderly government. In turn, a deep attachment to the land, and to the stability which rural life engenders, fostered the Roman virtues: gravitas, a sense of responsibility, peitas, a sense of devotion to family and country, and iustitia, a sense of the natural order.

- Modern attitudes to Roman civilization range from the infinitely impressed to the thoroughly disgusted. As always, there are the power worshippers, especially among historians, who are predisposed to admire whatever is strong, who feel more attracted to the might of Rome than to the subtlety of Greece. At the same time, there is a solid body of opinion that dislikes Rome. For many, Rome is at best the imitator and the continuator of Greece on a larger scale. Greek civilization had quality; Rome, mere quantity. Greece was original; Rome, derivative. Greece had style; Rome had money. Greece was the inventor; Rome, the research and development division. Such indeed was the opinion of some of the more intellectual Romans. "Had the Greeks held novelty in such disdain as we," asked Horace in his Epistles, "what work of ancient date would now exist?"

- Rome's debt to Greece was enormous. The Romans adopted Greek religion and moral philosophy. In literature, Greek writers were consciously used as models by their Latin successors. It was absolutely accepted that an educated Roman should be fluent in Greek. In speculative philosophy and the sciences, the Romans made virtually no advance on early achievements.

- Yet it would be wrong to suggest that Rome was somehow a junior partner in Greco-Roman civilization The Roman genius was projected into new spheres—especially into those of law, military organization, administration, and engineering Moreover, the tensions that arose within the Roman state produced literary and artistic sensibilities of the highest order. It was no accident that many leading Roman soldiers and statesmen were writers of high caliber.

1. **Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.**

O The regularity and power of stone walls inspired Romans attempting to unity the parts of their realm.
O Although the Romans used different types of designs when building their walls, they used regular controls to maintain their realm.
O Several types of control united the Roman realm, just as design and cement held Roman walls together.
O Romans built walls to unite the various parts of their realm into a single entity, which was controlled by powerful laws.

2. **According to paragraph 1, all of the following are controls that held together the Roman world EXCEPT**

O administrative and legal systems
O the presence of the military
O a common language
O transportation networks

3. The phrase "obsession with" in the passage is closest in meaning to

O thinking about
O fixation on
O interest-in
O attitude toward

4. According to paragraph 2, which of the following was NOT characteristic of Rome' s early development?

O Expansion by sea invasion
O Territorial expansion
O Expansion from one original settlement
O Expansion through invading armies

5. Why does the author mention "Alexander the Great" in the passage?

O To acknowledge that Greek civilization also expanded by land conquest
O To compare Greek leaders to Roman leaders
O To give an example of a Greek leader whom Romans studied
O To indicate the superior organization of the Greek military

6. The word "fostered" in the passage is closest in meaning to

O accepted
O combined
O introduced
O encouraged

7. Paragraph 3 suggests which of the following about the people of Latium?

O Their economy was based on trade relations with other settlements.
O They held different values than the people of Rome
O Agriculture played a significant role in their society
O They possessed unusual knowledge of animal instincts.

8. Paragraph 4 indicates that some historians admire Roman civilization because of

O the diversity of cultures within Roman society
O its strength
O its innovative nature
O the large body of literature that it developed

9. In paragraph 4, the author develops a description of Roman civilization by

O comparing the opinions of Roman intellectuals to Greek intellectuals
O identifying which characteristics of Roman civilization were copied from Greece
O explaining how the differences between Rome and Greece developed as time passed
O contrasting characteristics of Roman civilization with characteristics of Greek civilization

10. According to paragraph 4, intellectual Romans such as Horace held which of the following opinions about their civilization?

O Ancient works of Greece held little value in the Roman world.
O The Greek civilization had been surpassed by the Romans
O Roman civilization produced little that was original or memorable.
O Romans valued certain types of innovations that had been ignored by ancient Greeks.

11. The word "spheres" in the passage is closest in meaning to

O abilities
O areas
O combinations
O models

12. Which of the following statements about leading Roman soldiers and statesmen is supported by paragraphs 5 and 6?

O They could read and write the Greek language
O They frequently wrote poetry and plays.
O They focused their writing on military matters.
O They wrote according to the philosophical laws of the Greeks.

13. Look at the four squares ■ indicate where the following sentence could be added to the passage

They esteem symbols of Roman power, such as the massive Colosseum.

Where would the sentence best fit?
Click on a square [■] to add the sentence to the passage.

Modern attitudes to Roman civilization range from the infinitely impressed to the thoroughly disgusted. ■ As always, there are the power worshippers, especially among historians, who are predisposed to admire whatever is strong, who feel more attracted to the might of Rome than to the subtlety of Greece. ■ At the same time, there is a solid body of opinion that dislikes Rome. ■ For many, Rome is at best the imitator and the continuator of Greece on a larger scale. ■ Greek civilization had quality; Rome, mere quantity. Greece was original; Rome, derivative. Greece had style; Rome had money. Greece was the inventor; Rome, the research and development division. Such indeed was the opinion of some of the more intellectual Romans. "Had the Greeks held novelty in such disdain as we," asked Horace in his
Epistles, "what work of ancient date would now exist?"

Agriculture, Iron, and the Bantu Peoples

- There is evidence of agriculture in Africa prior to 3000 B.C. It may have developed independently, but many scholars believe that the spread of agriculture and iron throughout Africa linked it to the major centers of the Near East and Mediterranean world. The drying up of what is now the Sahara desert had pushed many peoples to the south into sub-Saharan Africa. These peoples settled at first in scattered hunting-and-gathering bands, although in some places near lakes and rivers, people who

fished, with a more secure food supply, lived in larger population concentrations. Agriculture seems to have reached these people from the Near East, since the first domesticated crops were millets and sorghums whose origins are not African but West Asian. Once the idea of planting diffused, Africans began to develop their own crops, such as certain varieties of rice, and they demonstrated a continued receptiveness to new imports. The proposed areas of the domestication of African crops lie in a band that extends from Ethiopia across southern Sudan to West Africa. Subsequently, other crops, such as bananas, were introduced from Southeast Asia.

- Livestock also came from outside Africa. Cattle were introduced from Asia, as probably were domestic sheep and goats. Horses were apparently introduced by the Hyksos invaders of Egypt (1780-1560 B.C.) and then spread across the Sudan to West Africa. Rock paintings in the Sahara indicate that horses and chariots were used to traverse the desert and that by 300-200 B.C., there were trade routes across the Sahara. Horses were adopted by peoples of the West African savannah, and later their powerful cavalry forces allowed them to carve out large empires. Finally, the camel was introduced around the first century AD. This was an important innovation, because the camel's ability to thrive in harsh desert conditions and to carry large loads cheaply made it an effective and efficient means of transportation. The camel transformed the desert from a barrier into a still difficult, but more accessible, route of trade and communication.

- Iron came from West Asia, although its routes of diffusion were somewhat different than those of agriculture. Most of Africa presents a curious case in which societies moved directly from a technology of stone to iron without passing through the intermediate stage of copper or bronze metallurgy, although some early copper-working sites have been found in West Africa. Knowledge of iron making penetrated into the forests and savannahs of West Africa at roughly the same time that iron making was reaching Europe. Evidence of iron making has been found in Nigeria, Ghana, and Mali.

- This technological shift caused profound changes in the complexity of African societies. Iron represented power. In West Africa the blacksmith who made tools and weapons had an important place in society, often with special religious powers and functions. Iron hoes, which made the land more productive, and iron weapons, which made the warrior more powerful, had symbolic meaning in a number of West African societies. Those who knew the secrets of making iron gained ritual and sometimes political power.

- Unlike in the Americas, where metallurgy was a very late and limited development, Africans had iron from a relatively early date, developing ingenious furnaces to produce the high heat needed for production and to control the amount of air that reached the carbon and iron ore necessary for making iron. Much of Africa moved right into the Iron Age, taking the basic technology and adapting it to local conditions and resources.

- The diffusion of agriculture and later of iron was accompanied by a great movement of people who may have carried these innovations. These people probably originated in eastern Nigeria. Their migration may have been set in motion by an increase in population caused by a movement of peoples fleeing the desiccation, or drying up, of the Sahara. They spoke a language, proto-Bantu ("bantu" means "the people"), which is the parent tongue of a large number of Bantu languages still spoken throughout sub-Saharan Africa. Why and how these people spread out into central and southern Africa remains a mystery, but archaeologists believe that their iron weapons allowed them to conquer their hunting-gathering opponents, who still used stone implements. Still, the process is

uncertain, and peaceful migration—or simply rapid demographic growth—may have also caused the Bantu explosion.

1. **The word " diffused " in the passage is closest in meaning to**

O emerged
O was understood
O spread
O developed

2. **According to paragraph 1, why do researchers doubt that agriculture developed independently in Africa?**

O African lakes and rivers already provided enough food for people to survive without agriculture
O The earliest examples of cultivated plants discovered in Africa are native to Asia.
O Africa's native plants are very difficult to domesticate
O African communities were not large enough to support agriculture

3. **In paragraph 1, what does the author imply about changes in the African environment during this time period?**

O The climate was becoming milder, allowing for a greater variety of crops to be grown
O Although periods of drying forced people south, they returned once their food supply was secure.
O Population growth along rivers and lakes was dramatically decreasing the availability of fish
O A region that had once supported many people was becoming a desert where few could survive

4. **According to paragraph 2, camels were important because they**

O were the first domesticated animal to be introduced to Africa
O allowed the people of the West African savannahs to carve out large empires
O helped African peoples defend themselves against Egyptian invaders
O made it cheaper and easier to cross the Sahara

5. **According to paragraph 2, which of the following were subjects of rock paintings in the Sahara?**

O Horses and chariots
O Sheep and goats
O Hyksos invaders from Egypt
O Camels and cattle

6. **What function does paragraph 3 serve in the organization of the passage as a whole?**

O It contrasts the development of iron technology in West Asia and West Africa.
O It discusses a non-agricultural contribution to Africa from Asia.
O It introduces evidence that a knowledge of copper working reached Africa and Europe at the same time
O It compares the rates at which iron technology developed in different parts of Africa.

7. The word "profound" in the passage is closest in meaning to

O fascinating
O far-reaching
O necessary
O temporary

8. The word "ritual" in the passage is closest in meaning to

O military
O physical
O ceremonial
O permanent

9. According to paragraph 4, all of the following were social effects of the new metal technology in Africa EXCEPT

O Access to metal tools and weapons created greater social equality.
O Metal weapons increased the power of warriors.
O Iron tools helped increase the food supply
O Technical knowledge gave religious power to its holders.

10. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

O While American iron makers developed the latest furnaces; African iron makers continued using earlier techniques
O Africans produced iron much earlier than Americans, inventing technologically sophisticated heating systems
O Iron making developed earlier in Africa than in the Americas because of the ready availability of carbon and iron ore.
O Both Africa and the Americas developed the capacity for making iron early, but African metallurgy developed at a slower rate.

11. The word "fleeing" in the passage is closest in meaning to

O afraid of
O displaced by
O running away from
O responding to

12. Paragraph 6 mentions all of the following as possible causes of the "Bantu explosion EXCEPT

O superior weapons
O better hunting skills
O peaceful migration
O increased population

13. Look at the four squares ■ indicate where the following sentence could be added to the passage.

These people had a significant linguistic impact on the continent as well.

Where would the sentence best fit?

Click on a square [■] to add the sentence to the passage

The diffusion of agriculture and later of iron was accompanied by a great movement of people who may have carried these innovations. These people probably originated in eastern Nigeria. ■ Their migration may have been set in motion by an increase in population caused by a movement of peoples fleeing the desiccation, or drying up, of the Sahara. ■ They spoke a language, proto-Bantu ("bantu" means "the people"), which is the parent tongue of a large number of Bantu languages still spoken throughout sub-Saharan Africa. Why and how these people spread out into central and southern Africa remains a mystery, but archaeologists believe that their iron weapons allowed them to conquer their hunting-gathering opponents, who still used stone implements. ■ Still, the process is uncertain, and peaceful migration—or simply rapid demographic growth—may have also caused the Bantu explosion. ■

Week 8
Prose Summary Questions

Necessary Skills

- Recognizing the organization and relative importance of information presented in the passage
- Understanding and locating specific points in a passage key to the gist of a passage as a whole
- Organizing information presented in a passage into a mental outline

Example Questions

- An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. The question is worth 2 points.

[You will see a sentence in bold here.]

Here are some tips for completing summaries:

1. First, look for hints in the first paragraph or two about the overall structure of the passage. For example, a sentence in the first part of the passage might say, "There are three main theories about .. :· If you see this kind of "outline" in the passage, then look for signal words or phrases that will introduce these theories: "The first theory ... " "The next theory .... ""The third theory .... "These will probably cor- respond to the three main points of your summary.

2. Unfortunately, there will usually not be an outline of the type mentioned in point 1. Then you will need to study the main idea of each paragraph of the passage and consider the way those main ideas are related. Sometimes, perhaps, two main ideas may be found in a single paragraph, but generally the main ideas of the passage will be developed in one or sometimes more than one paragraph. Look at the paragraphs and try to get a quick idea of what each paragraph is about. Begin by looking at the first sentence or two of each paragraph, because this is the most common position for a topic sentence that presents the paragraph's main idea. Make quick notes about each paragraph on your notepaper. Then look at the answer choices. If there are more paragraphs than answer choices, look for choices that combine the ideas of more than one paragraph. Or you may find that the ideas in some paragraphs are only details and not important enough to be mentioned in a summary.

3. Try to eliminate answer choices that are just details in the passage. These choices usually have a different "feel" to them. They may often be examples of main ideas but not restatements of the

major ideas themselves. They are about specific things or concepts rather than about general ideas.

4. Try to eliminate answer choices that do not appear in the passage. These may be about a completely different topic. They may also be about a topic related to the topic of the passage but not mentioned in the passage.

5. Try to eliminate answer choices that don't present the information accurately. They may repeat words from the passage but present it in a way that changes the meaning. They contradict information that is said to be true in the passage.

TPO 8

The Rise of Teotihuacán

- The city of Teotihuacan, which lay about 50 kilometers northeast of modern-day Mexico City, began its growth by 200 -100 B.C. At its height, between about AD. 150 and 700, it probably had a population of more than 125,000 people and covered at least 20 square kilometers. It had over 2,000 apartment complexes, a great market, a large number of industrial workshops, an administrative center, a number of massive religious edifices, and a regular grid pattern of streets and buildings. Clearly, much planning and central control were involved in the expansion and ordering of this great metropolis. Moreover, the city had economic and perhaps religious contacts with most parts of Mesoamerica (modern Central America and Mexico).

- How did this tremendous development take place, and why did it happen in the Teotihuacan Valley? Among the main factors are Teotihuacan's geographic location on a natural trade route to the south and east of the Valley of Mexico, the obsidian resources in the Teotihuacan Valley itself, and the valley's potential for extensive irrigation. The exact role of other factors is much more difficult to pinpoint—for instance, Teotihuacan's religious significance as a shrine, the historical situation in and around the Valley of Mexico toward the end of the first millennium B.C., the ingenuity and foresightedness of Teotihuacan's elite, and, finally, the impact of natural disasters, such as the volcanic eruptions of the late first millennium B.C.

- This last factor is at least circumstantially implicated in Teotihuacan's rise Prior to 200 B.C., a number of relatively small centers coexisted in and near the Valley of Mexico. Around this time, the largest of these centers, Cuicuilco, was seriously affected by a volcanic eruption, with much of its agricultural land covered by lava. With Cuicuilco eliminated as a potential rival, any one of a number of relatively modest towns might have emerged as a leading economic and political power in Central Mexico. The archaeological evidence clearly indicates, though, that Teotihuacan was the center that did arise as the predominant force in the area by the first century A.D.

- It seems likely that Teotihuacan's natural resources—along with the city elite's ability to recognize their potential—gave the city a competitive edge over its neighbors. The valley, like many other places in Mexican and Guatemalan highlands, was rich in obsidian. The hard volcanic stone was a resource that had been in great demand for many years, at least since the rise of the Olmecs (a people who flourished between 1200 and 400 B.C.), and it apparently had a secure market. Moreover, recent research on obsidian tools found at Olmec sites has shown that some of the obsidian obtained by the Olmecs originated near Teotihuacan. Teotihuacan obsidian must have been recognized as a valuable commodity for many centuries before the great city arose.

- Long-distance trade in obsidian probably gave the elite residents of Teotihuacan access to a wide variety of exotic goods, as well as a relatively prosperous life. Such success may have attracted immigrants to Teotihuacan. In addition, Teotihuacan's elite may have consciously attempted to attract new inhabitants. It is also probable that as early as 200 B.C. Teotihuacan may have achieved some religious significance and its shrine (or shrines) may have served as an additional population magnet. Finally, the growing population was probably fed by increasing the number and size of irrigated fields

- The picture of Teotihuacan that emerges is a classic picture of positive feedback among obsidian mining and working, trade, population growth, irrigation, and religious tourism. The thriving obsidian operation, for example, would necessitate more miners, additional manufacturers of obsidian tools, and additional traders to carry the goods to new markets. All this led to increased wealth, which in turn would attract more immigrants to Teotihuacan. The growing power of the elite, who controlled the economy, would give them the means physically coerce people to move to Teotihuacan and serve as additions to the labor force, More irrigation works would have to be built to feed the growing population, and this resulted in more power and wealth for the elite.

1. The word "massive' in the passage is closest in meaning
O ancient
O carefully planned
O very large
O carefully protected

2. In paragraph 1, each of the following is mentioned as a feature of the city of
Teotihuacan between A D 150 and 700 EXCEPT
O regularly arranged streets
O several administrative centers spread across the city
O many manufacturing workshops
Oapartment complexes

3. The word "pinpoint" in the passage is closest in meaning to
O identify precisely
O make an argument for
O describe
O understand

4. The word ingenuity in the passage is closest in meaning to
O ambition O sincerity O faith O cleverness

5. Which of the following is NOT mentioned in paragraph 2 as a main factor in the development of Teotihuacan?
O The presence of obsidian in the Teotihuacan Valley
O The potential for extensive irrigation of Teotihuacan Valley lands
O A long period of volcanic inactivity in the Teotihuacan Valley
OTeotihuacan's location on a natural trade route

6. Which of the following can be inferred from paragraphs 2 and 3 about the volcanic eruptions of the late first millennium B.C.?
O They were more frequent than historians once thought.
O They may have done more damage to Teotihuacan than to neighboring centers.
O They may have played a major role in the rise of Teotihuacan.
O They increased the need for extensive irrigation in the Teotihuacan Valley.

7. What can be inferred from paragraph 3 about Cuicuilco prior to 200 B.C.?
O It was a fairly small city until that date.
O It was located outside the Valley of Mexico.
O It emerged rapidly as an economical and political center.
O Its economy relied heavily on agriculture.

8. The word "predominant" in the passage is closest in meaning to
Omost aggressive O most productive O principal O earliest

9. Which of the following allowed Teotihuacan to have "a competitive edge over its neighbors"?
O A well-exploited and readily available commodity
O The presence of a highly stable elite class
O Knowledge derived directly from the Olmecs about the art of toolmaking
O Scarce natural resources in nearby areas such as those located in what are now the Guatemalan and Mexican highlands

10. According to paragraph 4, what has recent research on obsidian tools found at Olmec sites shown?

O Obsidian's value was understood only when Teotihuacan became an important city.
O The residents of Teotihuacan were sophisticated toolmakers.
OThe residents of Teotihuacan traded obsidian with the Olmecs as early as 400 B.C.
O Some of the obsidian used by the Olmecs came from the area around Teotihuacan.

11. Select the TWO answer choices that are mentioned in paragraph 5 as being features of Teotihuacan that may have attracted immigrants to the city to receive credit, you must select TWO answers.
O The prosperity of the elite
O Plenty of available housing
O Opportunities for well-paid agricultural employment
OThe presence of one or more religious shrines

12. In paragraph 6, the author discusses the "The thriving obsidian operation" in order to
O explain why manufacturing was the main industry of Teotihuacan
O give an example of an industry that took very little time to develop in Teotihuacan
O illustrate how several factors influenced each other to make Teotihuacan a powerful and wealthy city
Oexplain how a successful industry can be a source of wealth and a source of conflict at the same time

13.**Look at the four squares ■ that indicate where the following sentence could be added to the passage.**

In fact, artifacts and pottery from Teotihuacan have been discovered in sites as far away as the Mayan lowlands, the Guatemalan highlands, northern Mexico, and the Gulf Coast of Mexico.

Where would the sentence best fit?

The city of Teotihuacan, which lay about 50 kilometers northeast of modern-day Mexico City, began its growth by 200 -100 B.C. At its height, between about AD. 150 and 700, it probably had a population of more than 125,000 people and covered at least 20 square kilometers.■ It had over 2,000 apartment complexes, a great market, a large number of industrial workshops, an administrative center, a number of massive religious edifices, and a regular grid pattern of streets and buildings. ■ Clearly, much planning and central control were involved in the expansion and ordering of this great metropolis. ■Moreover, the city had economic and perhaps religious contacts with most parts of Mesoamerica (modern Central America and Mexico). ■

14. Directions- An introductory sentence for a bnef summary of the passage is provided below Complete the summary by selecting three answer choices that express the most important ideas in the passage Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage This question is worth 2 points.

Teotihuacan was a highly developed city in Mesoamerica that reached its peak between about A.D. 150 and 700.

Answer Choices

A. The number and sophistication of the architectural, administrative, commercial, and religious features of Teotihuacan indicate the existence of centralized planning and control

B. Several factors may account for Teotihuacan's extraordinary development, including its location, rich natural resources, irrigation potential, intelligent elite, and the misfortune of rival communities

C. In many important areas, from the obsidian industry to religious tourism, Teotihuacan's success and prosperity typified the classic positive feedback cycle

D. Teotihuacan may have developed its own specific local religion as a result of the cultural advances made possible by the city's great prosperity

E. As a result of its large number of religious shrines, by the first century AD, Teotihuacan became the most influential religious center in all of Mesoamenca

F. Although many immigrants settled in Teotihuacan between AD 150 and 700, the increasing threat of coerced labor discouraged further settlement and limited Teotihuacan's population growth

Extinction of the Dinosaurs

Paleozoic Era 334 to 248 millions years ago
Masozoic Era 245 to 65 million years ago
-Triassic Period
-Jurassic Period
-Cretaceous Period
Cenozoic Era 65 million years ago to the present

- Paleontologists have argued for a long time that the demise of the dinosaurs was caused by climatic alterations associated with slow changes in the positions of continents and seas resulting from plate tectonics off and on throughout the Cretaceous (the last period of the Mesozoic era, during which dinosaurs flourished), large shallow seas covered extensive areas of the continents. Data from diverse sources, including geochemia evidence preserved in seafloor sediments, indicate that the Late Cretaceous climate was milder than today's. The days were not too hot, nor the nights too cold. The summers were not too warm, nor the winters too frigid. The shallow seas on the continents probably buffered the temperature of the nearby air, keeping it relatively constant.

- At the end of the Cretaceous, the geological record shows that these seaways retreated from the continents back into the major ocean basins. No one knows why over a period of about 100,000 years, while the seas pulled back, climates around the world became dramatically more extreme warmer days, cooler nights; hotter summers, colder winters. Perhaps dinosaurs could not tolerate these extreme temperature changes and became extinct

- If true, though, why did cold-blooded animals such as snakes, lizards, turtles, and crocodiles survive the freezing winters and torrid summers? These animals are at the mercy of the climate to maintain a livable body temperature. It's hard to understand why they would not be affected whereas dinosaurs were left too crippled to cope, especially if, as some scientists believe, dinosaurs were warm blooded Critics also point out that the shallow seaways had retreated from and advanced on the continents numerous times during the Mesozoic, so why did the dinosaurs survive the climatic changes associated with the earlier fluctuations but not with this one? Although initially appealing, the hypothesis of a simple climatic change related to sea levels is insufficient to explain all the data

- Dissatisfaction with conventional explanations for dinosaur extinctions led to a surprising observation that, in turn, has suggested a new hypothesis. Many plants and animals disappear abruptly from the fossil record as one moves from layers of rock documenting the end of the Cretaceous up into rocks representing the beginning of the Cenozoic (the era after the Mesozoic). Between the last layer of Cretaceous rock and the first layer of Cenozoic rock, there is often a thin layer of clay. Scientists felt that they could get an idea of how long the extinctions took by determining how long it took to deposit this one centimeter of clay and they thought they could

determine the time it took to deposit the clay by determining the amount of the element iridium (lr) it contained

- Ir has not been common at Earth's surface since the very beginning of the planets history. Because it usually exists in a metallic state, it was preferentially incorporated in Earth's core as the planet cooled and consolidated. Ir is found in high concentrations in some meteorites, in which the solar system's original chemical composition is preserved. Even today, microscopic meteorites continually bombard Earth, falling on both land and sea. By measuring how many of these meteorites fall to Earth over a given period of time, scientists can estimate how long it might have taken to deposit the observed amount of Ir in the boundary clay These calculations suggest that a period of about one million years would have been required. However, other reliable evidence suggests that the deposition of the boundary clay could not have taken one million years. So the unusually high concentration of Ir seems to require a special explanation

- In view of these facts, scientists hypothesized that a single large asteroid about 10 to 15 kilometers across, collided with Earth, and the resulting fallout created the boundary clay. Their calculations show that the impact kicked up a dust cloud that cut off sunlight for several months, inhibiting photosynthesis in plants; decreased surface temperatures on continents to below freezing; caused extreme episodes acid rain and significantly raised long-term global temperatures through the greenhouse effect. This disruption of food chain and climate would have eradicated the dinosaurs and other organisms in less than fifty years.

1. According to paragraph 1, which of the following is true of the Late Cretaceous climate?

O Summers were very warm and winters were very cold
O Shallow seas on the continents caused frequent temperature changes.
O The climate was very similar to today's climate.
OThe climate did not change dramatically from season to season

2. Which of the following reasons is suggested in paragraph 2 for the extinction of the dinosaurs?

O Changes in the lengths of the days and nights during the Late Cretaceous period
O Droughts caused by the movement of seaways back into the oceans
O The change from mild to severe climates during the Late Cretaceous period
OAn extreme decrease in the average yearly temperature over 10,000 years

3. Why does the author mention the survival of "snakes, lizards, turtles, and crocodiles" in paragraph 3?

O To argue that dinosaurs may have become extinct because they were not cold-blooded animals
O To question the adequacy of the hypothesis that climatic change related to sea levels caused the extinction of the dinosaurs
O To present examples of animals that could maintain a livable body temperature more easily than dinosaurs
O To support a hypothesis that these animals were not as sensitive to climate changes in the Cretaceous period as they are today

4. The word cope in the passage is closest in meaning
O adapt
O move
O continue
O compete

5. According to paragraph 3, which of the following is true of changes in climate before the Cretaceous period and the effect of these changes on dinosaurs?
O Climate changes associated with the movement of seaways before the Cretaceous period did not cause dinosaurs to become extinct.
O Changes in climate before the Cretaceous period caused severe fluctuations in sea level, resulting in the extinction of the dinosaurs.
O Frequent changes in climate before the Cretaceous period made dinosaurs better able to maintain a livable body temperature.
O Before the Cretaceous period there were few changes in climate, and dinosaurs flourished.

6. The word "fluctuations" in the passage is closest in meaning to
Oextremes O retreats O periods O variations

7. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.
O The fossil record suggests that there was an abrupt extinction of many plants and animals at the end of the Mesozoic era.
O Few fossils of the Mesozoic era have survived in the rocks that mark the end of the Cretaceous.
O Fossils from the Cretaceous period of the Mesozoic up to the beginning of the Cenozoic era have been removed from the layers of rock that surrounded them. O Plants and animals from the Mesozoic era were unable to survive in the Cenozoic era.

8. In paragraph 4, all the following questions are answered EXCEPT:
O Why is there a layer of clay between the rocks of the Cretaceous and Cenozoic?
O Why were scientists interested in determining how long it took to deposit the layer of clay at the end of the Cretaceous?
O What was the effect of the surprising observation scientists made?
O Why did scientists want more information about the dinosaur extinctions at the end of the Cretaceous?

9. The word "bombard" in the passage is closest in meaning to
O approach O strike O pass O circle

10. Paragraph 5 implies that a special explanation of the Ir in the boundary clay is needed because
O the Ir in microscopic meteorites reaching Earth during the Cretaceous period would have been incorporated into Earth's core
O the Ir in the boundary clay was deposited much more than a million years ago
Othe concentration of Ir in the boundary clay is higher than in microscopic meteorites O the amount of Ir in the boundary clay is too great to have come from microscopic meteorites during the time the boundary clay was deposited

11.The word "disruption" in the passage is closest in meaning to
O exhaustion O disturbance O modification O disappearance

12. Paragraph 6 mentions all of the following effects of the hypothesized asteroid collision EXCEPT
O a large dust cloud that blocked sunlight
O an immediate drop in the surface temperatures of the continents
O an extreme decrease in rainfall on the continents
O a long-term increase in global temperatures

Ir has not been common at Earth's surface since the very beginning of the planets history. Because it usually exists in a metallic state, it was preferentially incorporated in Earth's core as the planet cooled and consolidated. Ir is found in high concentrations in some meteorites, in which the solar system's original chemical composition is preserved. Even today, microscopic meteorites continually bombard Earth, falling on both land and sea. By measuring how many of these meteorites fall to Earth over a given period of time, scientists can estimate how long it might have taken to deposit the observed amount of Ir in the boundary clay. ■These calculations suggest that a period of about one million years would have been required. ■However, other reliable evidence suggests that the deposition of the boundary clay could not have taken one million years. ■So the unusually high concentration of Ir seems to require a special explanation.■

13.Look at the four squares B that indicate where the following sentence could be added to the passage.

Consequently, the idea that the Ir in the boundary clay came from microscopic meteorites cannot be accepted.

Where would the sentence best fit?

Ir has not been common at Earth's surface since the very beginning of the planets history. Because it usually exists in a metallic state, it was preferentially incorporated in Earth's core as the planet cooled and consolidated. Ir is found in high concentrations in some meteorites, in which the solar system's original chemical composition is preserved. Even today, microscopic meteorites continually bombard Earth, falling on both land and sea. By measuring how many of these meteorites fall to Earth over a given period of time, scientists can estimate how long it might have taken to deposit the observed amount of Ir in the boundary clay. ■These calculations suggest that a period of about one million years would have been required. ■However, other reliable evidence suggests that the deposition of the boundary clay could not have taken one million years. ■So the unusually high concentration of Ir seems to require a special explanation.■

14. Directions- An introductory sentence for a bnef summary of the passage is provided below Complete the summary by selecting three answer choices that express the most important ideas in the passage Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage This question is worth 2 points.

For a long time scientists have argued that the extinction of the dinosaurs was related to climate change.

Answer Choices

A. Extreme changes in daily and seasonal climates preceded the retreat of the seas back into the major ocean basins.

B. The abruptness of extinctions at the end of the Cretaceous and the high concentration of Ir found in clay deposited at that time have fueled the development of a new hypothesis

C. Some scientists hypothesize that the extinction of the dinosaurs resulted from the effects of an asteroid collision with Earth.

D. A simple climate change does not explain some important data related to the extinction of the dinosaurs at the end of the Cretaceous.

E. The retreat of the seaways at the end of the Cretaceous has not been fully explained.

F. Boundary clay layers like the one between the Mesozoic and Cenozoic are used by scientists to determine the rate at which an extinct species declined.

Running Water on Mars?

- Photographic evidence suggests that liquid water once existed in great quantity on the surface of Mars. Two types of flow features are seen: runoff channels and outflow channels. Runoff channels are found in the southern highlands. These flow features are extensive systems—sometimes hundreds of kilometers in total length—of interconnecting, twisting channels that seem to merge into larger, wider channels. They bear a strong resemblance to river systems on Earth, and geologists think that they are dried-up beds of long-gone rivers that once carried rainfall on Mars from the mountains down into the valleys. Runoff channels on Mars speak of a time 4 billion years ago (the

age of the Martian highlands), when the atmosphere was thicker, the surface warmer, and liquid water widespread.

- Outflow channels are probably relics of catastrophic flooding on Mars long ago. They appear only in equatorial regions and generally do not form extensive interconnected networks. Instead, they are probably the paths taken by huge volumes of water draining from the southern highlands into the northern plains. The onrushing water arising from these flash floods likely also formed the odd teardrop-shaped "islands" (resembling the miniature versions seen in the wet sand of our beaches at low tide) that have been found on the plains close to the ends of the outflow channels. Judging from the width and depth of the channels, the flow rates must have been truly enormous—perhaps as much as a hundred times greater than the 105 tons per second carried by the great Amazon river. Flooding shaped the outflow channels approximately 3 billion years ago, about the same time as the northern volcanic plains formed.

- Some scientists speculate that Mars may have enjoyed an extended early period during which rivers, lakes, and perhaps even oceans adorned its surface. A 2003 Mars Global Surveyor image shows what mission specialists think may be a delta—a fan-shaped network of channels and sediments where a river once flowed into a larger body of water, in this case a lake filling a crater in the southern highlands. Other researchers go even further, suggesting that the data provide evidence for large open expanses of water on the early Martian surface. A computer-generated view of the Martian north polar region shows the extent of what may have been an ancient ocean covering much of the northern lowlands. The Hellas Basin, which measures some 3,000 kilometers across and has a floor that lies nearly 9 kilometers below the basin's rim, is another candidate for an ancient Martian sea.

- These ideas remain controversial. Proponents point to features such as the terraced "beaches" shown in one image, which could conceivably have been left behind as a lake or ocean evaporated and the shoreline receded. But detractors maintain that the terraces could also have been created by geological activity, perhaps related to the geologic forces that depressed the Northern Hemisphere far below the level of the south, in which case they have nothing whatever to do with Martian water. Furthermore, Mars Global Surveyor data released in 2003 seem to indicate that the Martian surface contains too few carbonate rock layers—layers containing compounds of carbon and oxygen—that should have been formed in abundance in an ancient ocean Then absence supports the picture of a cold, dry Mars that never experienced the extended mild period required to form lakes and oceans. However, more recent data imply that at least some parts of the planet did in fact experience long periods in the past during which liquid water existed on the surface

- Aside from some small-scale gullies (channels) found since 2000. which are inconclusive, astronomers have no direct evidence for liquid water anywhere on the surface of Mars today, and the amount of water vapor in the Martian atmosphere is tiny. Yet even setting aside the unproven hints of ancient oceans, the extent outflow channels suggests that a huge total volume of water existed on Mars in the past. Where did all the water go? The answer may be that virtually all the water on Mars is now locked in the permafrost layer under the surface, with more contained in the planet's polar caps

1. The word "merge" in the passage is closest in meaning to

O expand O separate O straighten out O combine

2. What does the discussion in paragraph 1 of runoff channels in the southern highlands suggest about Mars?
O The atmosphere of Mars was once thinner than it is today.
O Large amounts of rain once fell on parts of Mars.
OThe river systems of Mars were once more extensive than Earth's.
O The rivers of Mars began to dry up about 4 billion years ago.

3. The word "relics" in the passage is closest in meaning to
O remains O sites O requirements O sources

4. The word "miniature" in the passage is closest in meaning to
O temporary
O small
O multiple
O femliar

5. In paragraph 2, why does the author include the information that 105 tons of water flow through the Amazon river per second?
O To emphasize the great size of the volume of water that seems to have flowed through Mars' outflow channels
O To indicate data used by scientists to estimate how long ago Mars' outflow channels were formed
O To argue that flash floods on Mars may have been powerful enough to cause tear-shaped "islands" to form
O To argue that the force of flood waters on Mars was powerful enough to shape the northern volcanic plains

6. According to paragraph 2, all of the following are true of the outflow channels on Mars EXCEPT
O They formed at around the same time that volcanic activity was occurring on the northern plains.
O They are found only on certain parts of the Martian surface.
O They sometimes empty onto what appear to have once been the wet sands of tidal beaches.
OThey are thought to have carried water northward from the equatorial regions.

7. All of the following questions about geological features on Mars are answered in paragraph 3 EXCEPT:
O What are some regions of Mars that may have once been covered with an ocean?
O Where do mission scientists believe that the river forming the delta emptied? O Approximately how many craters on Mars do mission scientists believe may once have been lakes filled with water?
O During what period of Mars' history do some scientists think it may have had large bodies of water?

8. According to paragraph 3, images of Mars' surface have been interpreted as support for the idea that
O the polar regions of Mars were once more extensive than they are now
O a large part of the northern lowlands may once have been under water
O deltas were once a common feature of the Martian landscape
Othe shape of the Hellas Basin has changed considerably over time

9. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

O But detractors argue that geological activity may be responsible for the water associated with the terraces.
O But detractors argue that the terraces may have been formed by geological activity rather than by the presence of water.
O But detractors argue that the terraces may be related to geological forces in the Northern Hemisphere of Mars, rather than to Martian water in the south.
O But detractors argue that geological forces depressed the Northern Hemisphere so far below the level of the south that the terraces could not have been formed by water.

10. According to paragraph 4, what do the 2003 Global Surveyor data suggest about Mars?

O Ancient oceans on Mars contained only small amounts of carbon.
O The climate of Mars may not have been suitable for the formation of large bodies of water.
O Liquid water may have existed on some parts of Mars' surface for long periods of time.
OThe ancient oceans that formed on Mars dried up during periods of cold, dry weather.

11.The word "hints" in the passage is closest in meaning to

O clues O features O arguments O effects

12.Look at the four squares I that indicate where the following sentence could be added to the passage.

These landscape features differ from runoff channels in a number of ways.

Where would the sentence best fit?

Outflow channels are probably relics of catastrophic flooding on Mars long ago.■ They appear only in equatorial regions and generally do not form extensive interconnected networks. ■ Instead, they are probably the paths taken by huge volumes of water draining from the southern highlands into the northern plains. ■The onrushing water arising from these flash floods likely also formed the odd teardrop-shaped "islands" (resembling the miniature versions seen in the wet sand of our beaches at low tide) that have been found on the plains close to the ends of the outflow channels. ■ Judging from the width and depth of the channels, the flow rates must have been truly enormous—perhaps as much as a hundred times greater than the 105 tons per second carried by the great Amazon river. Flooding shaped the outflow channels approximately 3 billion years ago, about the same time as the northern volcanic plains formed.

13. Directions- An introductory sentence for a brief summary of the passage is provided below Complete the summary by selecting three answer choices that express the most important ideas in the passage Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage This question is worth 2 points.

There is much debate concerning whether Mars once had water.

Answer Choices

A. Mars' runoff and outflow channels are large-scale, distinctive features that suggest that large quantities of liquid water once flowed on Mars.

B. Although some researchers claim that Mars may once have had oceans, others dispute this, pointing to an absence of evidence or offering alternative interpretations of evidence

C. There is very little evidence of liquid water on Mars today, and it is assumed that all the water that once existed on the planet is frozen beneath its surface

D. While numerous gullies have been discovered on Mars since 2000, many astronomers dismiss them as evidence that Mars once had liquid water.

E. The runoff and outflow channels of Mars apparently carried a higher volume of water and formed more extensive networks than do Earth's river systems.

F. Various types of images have been used to demonstrate that most of the Martian surface contains evidence of flowing water.

Week 9
Review Test

TPO9

Colonizing the Americas via the Northwest Coast

- It has long been accepted that the Americas were colonized by a migration of peoples from Asia slowly traveling across a land bridge called Beringia (now the Bering Strait between northeastern Asia and Alaska) during the last Ice Age. ■The first water craft theory about this migration was that around 11,000-12,000 years ago there was an ice-free corridor stretching from eastern Beringia to tie areas of North America south of the great northern glaciers. It was this midcontinental corridor between two massive ice sheets---the Laurentide to the east and the Cordilleran to the west—that enabled the southward migration. ■But belief in this ice-free corridor began to crumble when paleoecologist Glen MacDonald demonstrated that some of the most important radiocarbon dates used to support the existence of an ice-free corridor were incorrect. ■He persuasively argued that such an ice-free corridor did not exist until much later, when the continental ice began its final retreat. ■

- Support is growing for the alternative theory that people using watercraft, possibly skin boats, moved southward from Beringia along the Gulf of Alaska and then southward along the Northwest Coast of North America possibly as early as 16,000 years ago. This route would have enabled humans to enter southern areas of the Americas prior to the melting of the continental glaciers. Until the early 1970s, most archaeologists did not consider the coast a possible migration route into the Americas because geologists originally believed that during the last Ice Age the entire Northwest Coast was covered by glacial ice. It had been assumed that the ice extended westward from the Alaskan/Canadian mountains to the very edge of the continental shelf, the flat, submerged part of the continent that extends into the ocean. This would have created a barrier of ice extending from the Alaska Peninsula, through the Gulf of Alaska and southward along the Northwest Coast of North America to what is today the state of Washington.

- The most influential proponent of the coastal migration route has been Canadian archaeologist Knut Fladmark. He theorized that with the use of watercraft, people gradually colonized unglaciated refuges and areas along the continental shelf exposed by the lower sea level. Fladmark's hypothesis received additional support from the fact that the greatest diversity in Native American languages occurs along the west coast of the Americas, suggesting that this region has been settled the longest.

- More recent geologic studies documented deglaciation and the existence of ice-free areas throughout major coastal areas of British Columbia, Canada, by 13,000 years ago. Research now indicates that sizable areas of southeastern Alaska along the inner continental shelf were not covered by ice toward the end of the last Ice Age. One study suggests that except for a 250-mile coastal area between southwestern British Columbia and Washington State, the Northwest Coast of North America was largely free of ice by approximately 16,000 years ago. Vast areas along the coast may have been deglaciated beginning around 16,000 years ago, possibly providing a coastal corridor for the movement of plants, animals, and humans sometime between 13,000 and 14,000 years ago.

- The coastal hypothesis has gained increasing support in recent years because the remains of large land animals, such as caribou and brown bears, have been found in southeastern Alaska dating

between 10.000 and 12,500 years ago. This is the time period in which most scientists formerly believed the area to be inhospitable for humans. It has been suggested that if the environment were capable of supporting breeding populations of bears, there would have been enough food resources to support humans. Fladmark and others believe that the first human colonization of America occurred by boat along the Northwest Coast during the very late Ice Age. possibly as early as 14,000 years ago. The most recent geologic evidence indicates that it may have been possible for people to colonize ice-free regions along the continental shelf that were still exposed by the lower sea level between 13,000 and 14,000 years ago

- The coastal hypothesis suggests an economy based on manne mammal hunting, saltwater fishing, shellfish gathering, and the use of watercraft. Because of the barrier of ice to the east, the Pacific Ocean to the west, and populated areas to the north, there may have been a greater impetus for people to move in a southerly direction.

1. According to paragraph 1, the theory that people first migrated to the Americas by way of an ice-free corridor was seriously called into question by

○ paleoecologist Glen MacDonald's argument that the original migration occurred much later than had previously been believed
○ the demonstration that certain previously accepted radiocarbon dates were incorrect ○ evidence that the continental ice began its final retreat much later than had previously been believed
○ research showing that the ice-free corridor was not as long lasting as had been widely assumed

2.The word "persuasively" is closest in meaning to
○ Aggressively ○ inflexibly ○ convincingly ○ carefully

3. Paragraph 2 begins by presenting a theory and then goes on to
○ discuss why the theory was rapidly accepted but then rejected
○ present the evidence on which the theory was based
○ cite evidence that now shows that the theory is incorrect
○ explain why the theory was not initially considered plausible

4. The phrase "prior to" is closest in meaning to
○ before
○ immediately after
○ during
○ in spite of

5. Paragraph 2 supports the idea that, before the 1970s, most archaeologists held which of the following views about the earliest people to reach the Americas?

○ They could not have sailed directly from Beringia to Alaska and then southward because, it was thought glacial ice covered the entire coastal region. ○ They were not aware that the climate would continue to because milder.

○ They would have had no interest in migrating southward from Beringia until after the continental glaciers had begun to melt.

○ They lacked the navigational skills and appropriate boats needed for long-distance trips.

6. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

○ Because this region has been settled the longest, it also displays the greatest diversity in Native American languages.

○ Fladmark's hypothesis states that the west coast of the Americas has been settled longer than any other region.

○ The fact that the greatest diversity of Native Americas languages occurs along the west coast of the Americas lends strength to Fladmark's hypothesis.

○ According to Fladmark, Native American languages have survived the longest along west coast of the Americas.

7. The author's purpose in paragraph 4 is to

○ indicate that a number of recent geologic studies seem to provide support for the coastal hypothesis

○ indicate that coastal and inland migrations may have happened simultaneously

○ explain why humans may have reached America's northwest coast before animals and plants did

○ show that the coastal hypothesis may explain how people first reached Alaska but it cannot explain how people reached areas like modern British Columbia and Washington State

8. The word "vast" in the passage is closet in meaning to

○ Frozen

○ Various

○ Isolated

○ Huge

9. According to paragraph 5, the discovery of the remains of large land animals supports the coastal hypothesis by providing evidence that

○ humans were changing their hunting techniques to adapt to coastal rather than inland environments

○ animals had migrated from the inland to the coasts, an indication that a midcontinental ice-free corridor was actually implausible

○ humans probably would have been able to find enough resources along the coastal corridor

○ the continental shelf was still exposed by lower sea levels during the period when the southward migration of people began

10. The word "inhospitable" in the passage is closet in meaning to

○ not familiar

○ not suitable

○ not dangerous

○ not reachable

11. According to paragraph 5, the most recent geologic research provides support for a first colonization of America dating as far back as

○ 16,000 years ago

○ 14,000 years ago

○ 12,500 years ago

○ 10,000 years ago

12. The word "impetus" in the passage is closest in meaning to

○ chance

○ protection

○ possibility

○ incentive

13.Look at the four squares[■] that indicate where the following sentence could be added to the passage.

Moreover, other evidence suggests that even if an ice-free corridor did exist, it would have lacked the resources needed for human colonization.

Where would the sentence best fit?

14. Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points.

Recent evidence favors a rival to the long-standing theory that the Americas were colonized 11,000---12,000 years ago by people migrating south from Beringia along a midcontinental ice-free corridor.

Answer choices

A. Evidence that an ice-free corridor between two ice sheets developed when the continental ice first began to melt came primarily from radiocarbon dating.

B. Recent geologic evidence indicates that contrary to what had been believed, substantial areas along the coast were free of ice as early as 16,000 years ago.

C. There is evidence suggesting that areas along the coast may have contained enough food resources between 13,000 and 14,000 years ago to have made human colonization possible.

D. There is growing support for the theory that migration too took place much earlier, by sea, following a coastal route along Alaska and down the northwest coast.

E. Research now indicates that the parts of the inner continental shelf that remained covered with ice were colonized by a variety of early human groups well adapted to living in extremely cold environments.

F. Even though the northern part of the continent allowed for a more varied economy, several early human groups quickly moved south.

Reflection in Teaching

- Teachers, it is thought, benefit from the practice of reflection, the conscious act of thinking deeply about and carefully examining the interactions and events within their own classrooms. Educators T. Wildman and J Niles (1987) describe a scheme for developing reflective practice in experienced teachers. This was justified by the view that reflective practice could help teachers to feel more intellectually involved in their role and work in teaching and enable them to cope with the paucity of scientific fact and the uncertainty of knowledge in the discipline of teaching.

- Wildman and Niles were particularly interested in investigating the conditions under which reflection might flourish—a subject on which there is little guidance in the literature. They designed an experimental strategy for a group of teachers in Virginia and worked with 40 practicing teachers over several years. They were concerned that many would be "drawn to these new, refreshing conceptions of teaching only to find that the void between the abstractions and the realities of teacher

reflection is too great to bridge. Reflection on a complex task such as teaching is not easy." The teachers were taken through a program of talking about teaching events, moving on to reflecting about specific issues in a supported, and later an independent manner.

- Wildman and Niles observed that systematic reflection on teaching required a sound ability to understand classroom events in an objective manner. They describe the initial understanding in the teachers with whom they were working as being "utilitarian... and not rich or detailed enough to drive systematic reflection." Teachers rarely have the time or opportunities to view their own or the teaching of others in an objective manner. Further observation revealed the tendency of teachers to evaluate events rather than review the contributory factors in a considered manner by, in effect, standing outside the situation.

- Helping this group of teachers to revise their thinking about classroom events became central. ■This process took time and patience and effective trainers. ■The researchers estimate that the initial training of the teachers to view events objectively took between 20 and 30 hours, with the same number of hours again being required to practice the skills of reflection.

- ■Wildman and Niles identify three principles that facilitate reflective practice in a teaching situation. ■The first is support from administrators in an education system, enabling teachers to understand the requirements of reflective practice and how it relates to teaching students. The second is the availability of sufficient time and space. The teachers in the program described how they found it difficult to put aside the immediate demands of others in order to give themselves the time they needed to develop their reflective skills. The third is the development of a collaborative environment with support from other teachers. Support and encouragement were also required to help teachers in the program cope with aspects of their professional life with which they were not comfortable. Wildman and Niles make a summary comment: "Perhaps the most important thing we learned is the idea of the teacher-as-reflective-practitioner will not happen simply because it is a good or even compelling idea."

- The work of Wildman and Niles suggests the importance of recognizing some of the difficulties of instituting reflective practice. Others have noted this, making a similar point about the teaching profession's cultural inhibitions about reflective practice. Zeichner and Liston (1987) point out the inconsistency between the role of the teacher as a (reflective) professional decision maker and the more usual role of the teacher as a technician, putting into practice the ideas of others. More basic than the cultural issues is the matter of motivation. Becoming a reflective practitioner requires extra work (Jaworski, 1993) and has only vaguely defined goals with, perhaps, little initially perceivable reward and the threat of vulnerability. Few have directly questioned what might lead a teacher to want to become reflective. Apparently, the most obvious reason for teachers to work toward reflective practice is that teacher educators think it is a good thing. There appear to be many unexplored matters about the motivation to reflect—for example, the value of externally motivated reflection as opposed to that of teachers who might reflect by habit.

1. The word "justified" in the passage is closest in meaning to

○ supported

○ shaped

○ stimulated

○ suggested

2. According to paragraph 1, it was believed that reflection could help teachers
○ understand intellectual principles of teaching
○ strengthen their intellectual connection to their work
○ use scientific fact to improve discipline and teaching
○ adopt a more disciplined approach to teaching

3. The word "flourish" in the passage is closest in meaning to
○ continue
○ occur
○ succeed
○ apply

4. All of the following are mentioned about the experimental strategy describe in paragraph 2 EXCEPT
○ It was designed so that teachers would eventually reflect without help from others.
○ It was used by a group of teachers over a period of years.
○ It involved having teachers take part in discussions of classroom events. ○ It involved having teachers record in writing their reflections about teaching.

5. According to paragraph 2, Wildman and Niles worried that teachers they were working with might feel that
○ the number of teachers involved in their program was too large
○ the concepts of teacher reflection were so abstract that they could not be applied
○ the ideas involved in reflection were actually not new and refreshing
○ several years would be needed to acquire the habit of reflecting on their teaching

6. The word "objective" in the passage is closest in meaning to
○ unbiased
○ positive
○ systematic
○ thorough

7. According to paragraph 3, what did the teachers working with Wildman and Niles often fail to do when they attempted to practice reflection?
○ Correctly calculate the amount of time needed for reflection
○ Provide sufficiently the descriptions of the methods they used to help them reflect
○ Examine thoughtfully the possible causes of events in their classrooms
○ Establish realistic goals for themselves in practicing reflection

8. How is paragraph 4 related to other aspects of the discussion of reflection in the passage?
○ It describes and comments on steps taken to overcome problems identified earlier in the passage.
○ It challenges the earlier claim that teachers rarely have the time to think about their own or others' teaching.
○ It identifies advantages gained by teachers who followed the training program described earlier in the passage.

○ It explains the process used to define the principles discussed later in the passage.

9. The word "compelling" in the passage is closest in meaning to
○ commonly
○ persuasive
○ original
○ practical

10. According to paragraph 6, teachers may be discourage from reflecting because
○ it is not generally supported by teacher educators
○ the benefits of reflection may not be apparent immediately
○ it is impossible to teach and reflect on one's teaching at the same time ○ they have often failed in their attempts to become reflective practitioners

11. Which of the sentences below best express the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.
○ The practice of being reflective is no longer simple a habit among teachers but something that is externally motivated.
○ Most teachers need to explore ways to form the habit of reflection even when no external motivation exists.
○ Many aspects of the motivation to reflect have not been studied, including the comparative benefits of externally motivated and habitual reflection among teachers. ○ There has not been enough exploration of why teachers practice reflection as a habit with or without external motivation.

12.Look at the four squares [■] that indicate where the following sentence could be added to the passage.

However, changing teachers' thinking about reflection will not succeed unless there is support for reflection in the teaching environment.

Where would the sentence best fit?

13. Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. The question is worth 2 points.

Wildman and Niles have conducted research on reflection in teaching.

Answer Choices

A. Through their work with Virginia teachers, Wildman and Niles proved conclusively that reflection, though difficult, benefits both teachers and students.

B. Wildman and Niles identified three principles that teachers can use to help themselves cope with problems that may arise as a result of reflection.

C. There are numerous obstacles to implementing reflection in schools and insufficient understanding of why teachers might want to reflect.

D. Wildman and Niles found that considerable training and practice are required to understand classroom events and develop the skills involved in reflection.

E. Wildman and Niles concluded that teachers need sufficient resources as well as the cooperation and encouragement of others to practice reflection.

F. Whether teachers can overcome the difficulties involved in reflection may depend on the nature and intensity of their motivation reflect.

The Arrival of Plant Life in Hawaii

- When the Hawaiian Islands emerged from the sea as volcanoes, starting about five million years ago they were far removed from other landmasses. Then, as blazing sunshine alternated with drenching rains, the harsh, barren surfaces of the black rocks slowly began to soften. Winds brought a variety of life-forms.

- Spores light enough to float on the breezes were carried thousands of miles from more ancient lands and deposited at random across the bare mountain flanks. A few of these spores found a toehold on the dark, forbidding rocks and grew and began to work their transformation upon the land. Lichens were probably the first successful flora. These are not single individual plants; each one is a symbiotic combination of an alga and a fungus. The algae capture the Sun's energy by photosynthesis and store it in organic molecules. The fungi absorb moisture and mineral salts from the rocks, passing these on in waste products that nourish algae. It is significant that the earliest living things that built communities on these islands are examples of symbiosis, a phenomenon that depends upon the close cooperation of two or more forms of life and a principle that is very important in island communities.

- Lichens helped to speed the decomposition of the hard rock surfaces, preparing a soft bed of soil that was abundantly supplied with minerals that had been carried in the molten rock from the bowels of Earth. Now, other forms of life could take hold: ferns and mosses (two of the most ancient types of land plants) that flourish' even in rock crevices. ■These plants propagate by producing spores—tiny fertilized cells that contain all the instructions for making a new plant— but the spores are unprotected by any outer coating and carry no supply of nutrient. ■Vast numbers of them fall on the ground beneath the mother plants. ■Sometimes they are earned farther afield by water or by wind. ■But only those few spores that settle down in very favorable locations can start new life; the vast majority fall on barren ground. By force of sheer numbers, however, the mosses and ferns reached Hawaii, survived, and multiplied. Some species developed great size, becoming tree ferns that even now grow in the Hawaiian forests.

- Many millions of years after ferns evolved (but long before the Hawaiian Islands were born from the sea), another kind of flora evolved on Earth: the seed-bearing plants. This was a wonderful biological invention .The seed has an outer coating that surrounds the genetic material of the new plant, and inside this covering is a concentrated supply of nutrients. Thus, the seed's chances of survival are greatly enhanced over those of the naked spore. One type of seed-bearing plant, the angiosperm, includes all forms of blooming vegetation. In the angiosperm the seeds are wrapped in an additional layer of covering. Some of these coats are hard— like the shell of a nut— for extra protection. Some are soft and tempting, like a peach or a cherry. In some angiosperms the seeds are equipped with gossamer wings, like the dandelion and milkweed seeds. These new characteristics offered better ways for the seeds to move to new habitats. They could travel through the air, float in water, and lie dormant for many months.

- Plants with large, buoyant seeds—like coconuts—drift on ocean currents and are washed up on the shores. Remarkably resistant to the vicissitudes of ocean travel, they can survive prolonged immersion in saltwater. When they come to rest on warm beaches and the conditions are favorable, the seed coats soften Nourished by their imported supply of nutrients, the young plants push out their roots and establish their place in the sun.

- By means of these seeds, plants spread more widely to new locations, even to isolated islands like the Hawaiian archipelago, which lies more than 2,000 miles west of California and 3,500 miles east of Japan The seeds of grasses, flowers, and blooming trees made the long trips to these islands (Grasses are simple forms of angiosperms that bear their encapsulated seeds on long stalks.) In a surprisingly short time, angiosperms filled many of the land areas on Hawaii that had been bare.

1. The phrase "at random" in the passage is closest in meaning to

○ finally

○ over a long period of time

○ successfully

○ without a definite pattern

2. It can be inferred from paragraph 2 that the fungi in lichens benefit from their symbiotic relationship with algae in what way?

○ The algae help the fungi meet some of their energy needs. ○ The algae protect the fungi from the Sun's radiation.

○ The algae provide the fungi with greater space for absorbing water.

○ The fungi produce less waste in the presence of algae.

3. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

○ Some of the earliest important examples of symbiosis---the close cooperation of two or more living things---occur in island communities.

○ Symbiosis---the close cooperation of pairs or small groups of living organisms---is especially important in these island environments.

○ The first organisms on these islands worked together closely in a relationship known as symbiosis, which is particularly important on islands.

○ It is significant to note that organisms in the beginning stages of the development of island life cannot survive without close cooperation.

4. The word "abundantly" in the passage is closest in meaning to

○ occasionally

○ plentifully

○ usefully

○ fortunately

5. The word "propagate" in the passage is closest in meaning to

○ multiple

○ emerge

○ live

○ evolve

6. According to paragraph 3, what was the relationship between lichens and ferns in the development of plant life on Hawaii?

○ Ferns were able to grow because lichens created suitable soil.

○ The decomposition of ferns produced minerals that were used by lichens ○ Lichens and ferns competed to grow in the same rocky environments.

○ Lichens and ferns were typically found together in volcanic areas.

7. According to paragraph 4, why do seeds have a greater chance of survival than spores do? To receive credit, you must select TWO answer choices.

□ Seeds need less water to grow into a mature plant than spores do

□ Seeds do not need to rely on outside sources of nutrients.

□ Seeds are better protected from environmental dangers than spores are.

□ Seeds are heavier than spores and the therefore more likely to take root and grow.

8. Why does the author mention "a nut", "a peach", and " a cherry"?

○ To indicate that some seeds are less likely to survive than others
○ To point out that many angiosperms can be eaten
○ To provide examples of blooming plants
○ To illustrate the variety of coverings among angiosperm seeds

9. The word "dormant" in the passage is closest in meaning to

○ hidden
○ inactive
○ underground
○ preserved

10. According to paragraph 5, a major reason that coconuts can establish themselves in distant locations is that their seeds can

○ survive long exposure to heat on island beaches
○ float and survive for long periods in ocean water
○ use saltwater for maintenance and growth
○ maintain hard, protective coats even after growing roots

11. According to the passage, which of the following characteristics do spores and seeds have in common?

○ They may be surrounded by several layers of covering.
○ They are produced by flowering plants.
○ They may be spread by wind.
○ They are able to grow in barren soils.

12. Look at the four squares [■] that indicate where the following sentence could be added to the passage.

So since the chances of survival for any individual spore are small, the plants have to produce many spores in order to propagate.

Where would the sentence best fit?

14. Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. The question is worth 2 points.

After the formation of the Hawaiian Islands, much time passed before conditions were suitable for plant life.

Answer Choices

A. Algae are classified as symbiotic because they produce energy through the process of photo synthesis.

B. Lichens helped create favorable conditions for the growth of spore-producing plants such as ferns and mosses.

C. Unlike spores, seeds must move to new habitats in order to have a strong chance of survival and growth.

D. The first successful plants on Hawaii were probably lichens, which consist of algae and fungi living in a symbiotic relationship.

E. Seed-bearing plants evolved much later than spore-producing plants, but both types of plants had evolved well before the formation of the Hawaiian islands.

F. Seed-bearing plants arrived and spread quickly in Hawaii, thanks to characteristics that increased their seeds' ability to survive and to move to different areas.