Alfred Wegener’ s Theory of Continental Drift

【Paragraph 1】In 1912, the German geologist Alfred Wegener proposed that Earth's continents are mobile rafts of lighter crust that have shifted over time by plowing their way through the denser crust of the oceans. The theory, called continental drift, was partly motivated by the apparent fit, like puzzle pieces, of the coastlines of South America and Africa. Wegener first presented his theory of continental drift at a meeting and in a paper, and then as a book. The Origin of Continents and Oceans, published in 1915. He continued to write updated versions of this work until his death in an ill-fated expedition to Greenland in 1930. Wegener maintained that Earth is composed of concentric shells of increasing density from crust to core. The outermost shell is not continuous but made of continental blocks of lighter rock called sial (an acronym for silica- and aluminum-rich rock) floating in the denser sima (silica- and magnesia-rich rock) underlying the oceans. All the continents had been joined in the supercontinent of Pangaea. As the continent broke up, the pieces moving apart left bits behind, explaining the presence of nonvolcanic islands and island chains, according to Wegener. Where the moving pieces collided, mountains formed. They were thrust up either by the plowing of the continents through the sima, as in the case of the Andes, or by the colliding of two blocks of sial, as in the case of the Himalayas. As for the force driving continental drift, Wegener initially invoked Polfluchtkraft-a force causing flight from the poles as a result of Earth’ s rotation-and later the tidal force resulting from the gravitational attraction between Earth and the Moon and Sun.

【Paragraph 2】One of the most influential geologists to join the mobilist camp, as the drifters school became known, was Arthur Holmes. Holmes recognized the importance of radioactive heat-which had recently been discovered-and realized that there must be a mechanism to remove it from Earth’ s interior. That mechanism, he argued, is convection-the rising of less dense material and the sinking of more dense material. He went on to propose that the mantle (the part of Earth’ s interior below the outer crust and above the core) convects in large, circulating patterns, and that this motion carries the continents across Earth’ s surface He also related crustal movement and mantle convection to the evolution of mountain belts. Wegener adopted Holmes's mechanism in the last rendition of his theory Holmes, for his part, presented his grand concept of a dynamic Earth in his influential and popular text Principles of Physical Geology, published in 1944.

【Paragraph 3】Although it was eventually supplanted by the theory of plate tectonics, Wegener’ s theory of continental drift influenced science because it explained disparate observations, because it was placed in the context of existing theories, and because it offered a coherent view of Earth's evolution. For example, Wegener showed not only that the coastlines on opposite sides of the Atlantic fit together, but that geologic features on the different continents fit as well. He asserted that the Appalachians, which can be traced northward through the Canadian Maritime Provinces, match the Caledonian Mountains in Scotland and Norway. He marshaled evidence from the distributions of fossil and living species to argue that land bridges joining continents were less likely than a single continent. The example commonly cited is that of Mesosaurus, a shoreline scavenger reptile that lived in the Permian period and is found as fossils in rocks on both sides of the South Atlantic Ocean. Mesosaurus was thought not to be a great swimmer, certainly not able to cross an ocean.

【Paragraph 4】Wegener also found supporting evidence in ancient climates. Mounting observations indicated that the past climate of many regions was much different from the present climate. In the tropics, geologists had found sand and gravel left by ancient glaciers, and in rainy regions they had located prehistoric deserts. Then there was the discovery, by a British expedition, of plant fossils only 600 kilometers (370 miles) from the South Pole. Particularly puzzling was evidence suggesting that widely different climates in different regions had occurred at the same time, so one could not account for different climates by claiming simply that the whole of Earth was once hotter or once cooler than now. Wegener solved this dilemma by showing that observations of paleoclimate could be explained if the positions of the continents had shifted relative to those of the poles.

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

A. required

B. popular

C. newer

D. various

2. According to paragraph 1, the presence of nonvolcanic islands was an indication to Wegener that

A. sial was lighter than was once believed

B. a supercontinent that existed at one time broke apart

C. nonvolcanic islands were formed from the sima rather than the sial

D. island chains existed prior to the formation of the supercontinent Pangaea

3. Why are the Andes and Himalaya mountains mentioned in the discussion in paragraph 1?

A. To contrast the ways in which islands and mountains formed

B. To describe two ways in which movements of land formed mountains

C. To provide examples of mountain ranges that are no longer in their original locations

D. To explain the differences between sial and sima with well-known geographic areas

4. 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

【Paragraph 1】In 1912, the German geologist Alfred Wegener proposed that Earth's continents are mobile rafts of lighter crust that have shifted over time by plowing their way through the denser crust of the oceans. The theory, called continental drift, was partly motivated by the apparent fit, like puzzle pieces, of the coastlines of South America and Africa. Wegener first presented his theory of continental drift at a meeting and in a paper, and then as a book. The Origin of Continents and Oceans, published in 1915. He continued to write updated versions of this work until his death in an ill-fated expedition to Greenland in 1930. Wegener maintained that Earth is composed of concentric shells of increasing density from crust to core. The outermost shell is not continuous but made of continental blocks of lighter rock called sial (an acronym for silica- and aluminum-rich rock) floating in the denser sima (silica- and magnesia-rich rock) underlying the oceans. All the continents had been joined in the supercontinent of Pangaea. As the continent broke up, the pieces moving apart left bits behind, explaining the presence of nonvolcanic islands and island chains, according to Wegener. Where the moving pieces collided, mountains formed. They were thrust up either by the plowing of the continents through the sima, as in the case of the Andes, or by the colliding of two blocks of sial, as in the case of the Himalayas. As for the force driving continental drift, Wegener initially invoked Polfluchtkraft-a force causing flight from the poles as a result of Earth’ s rotation-and later the tidal force resulting from the gravitational attraction between Earth and the Moon and Sun.

A. Wegener's term “Polfluchtkraft'' was first used to mean Earth's rotation and later the gravitational attraction between Earth and the Moon and Sun.

B. Continental drift required a powerful driving force that was created by the combination of Earth’ s rotation and tidal movements, which Wegener called “Polfluchtkraft."

C. At first Wegener believed that the movement of the continents was caused by Earth’ s rotation but later came to believe that the drift was caused by powerful tides.

D. According to Wegener, the great force of continental drift first affected Earth's rotation at the poles and later also affected the gravitational force of Earth’ s tides.

5. What does paragraph 2 suggest about how Holmes influenced Wegener’ s thinking?

A. He encouraged Wegener to consult the geologists who formed the drifters school

B. He convinced Wegener that the mantle contained a great deal of radioactive heat.

C. He demonstrated to Wegener that the density of geographic material was less important than its pattern of movement

D. He provided Wegener with a more accurate explanation of the mechanism by which continents moved and mountains evolved

6. According to paragraph 3, Wegener' s theory of continental drift was important scientifically for all of the following reasons EXCEPT:

A. It introduced the concept of plate tectonics.

B. explained a wide range of recorded phenomena.

C. It related to and included information from scientific research available at the time.

D. It provided a logical understanding of how Earth evolved

7. What is the importance of Wegener' s observation that the Appalachians, which can be traced northward through the Canadian Maritime Provinces, match the Caledonian Mountains in Scotland and Norway?

【Paragraph 3】Although it was eventually supplanted by the theory of plate tectonics, Wegener' s theory of continental drift influenced science because it explained disparate observations, because it was placed in the context of existing theories, and because it offered a coherent view of Earth's evolution. For example, Wegener showed not only that the coastlines on opposite sides of the Atlantic fit together, but that geologic features on the different continents fit as well. He asserted that the Appalachians, which can be traced northward through the Canadian Maritime Provinces, match the Caledonian Mountains in Scotland and Norway. He marshaled evidence from the distributions of fossil and living species to argue that land bridges joining continents were less likely than a single continent. The example commonly cited is that of Mesosaurus, a shoreline scavenger reptile that lived in the Permian period and is found as fossils in rocks on both sides of the South Atlantic Ocean. Mesosaurus was thought not to be a great swimmer, certainly not able to cross an ocean.

A. It provides additional evidence for Wegener' s claim that separate continents were once connected to each other.

B. It indicates that the mechanism by which all mountainous areas on Earth formed was the same

C. It suggests that continental drift occurred in a northward direction.

D. challenges the role of the Atlantic Ocean in shaping continental coastlines.

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

A. claimed

B. worried

C. repeated

D. doubted

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

A. analyzed

B. argued about

C. recalled

D. referred to

10. Mesosaurus is mentioned in paragraph 3 to make which of the following points?

A. The presence of its fossils suggests that a land bridge once existed across the South Atlantic Ocean

B. The fact that a reptilian species scavenged along the shoreline indicates that various species must have been there when reptiles arrived.

C. The dating of its fossils to the Permian period led Wegener to believe that this was the time when major movements of rocks and continents ended

D. The lack of this species' swimming ability supports the idea that the shores where its fossils were found must have been joined at one time

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

A. Careful

B. Familiar

C. Increasing

D. Reliable

12. What was the dilemma that Wegener solved?

A. Why prehistoric fossils occurred in deserts but not rainy regions

B. Whether sand and gravel were once part of ancient glaciers

C. How to explain great climatic variations occurring at the same time among various regions

D. Whether the overall temperature of Earth was once hotter or colder

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

The publication was met by skepticism from scientists the world over, yet he refused to become discouraged.

Where would the sentence best fit? Click on a square 【】 to add the sentence to the passage.

【Paragraph 1】In 1912, the German geologist Alfred Wegener proposed that Earth's continents are mobile rafts of lighter

crust that have shifted over time by plowing their way through the denser crust of the oceans. 【A】The theory, called continental drift, was partly motivated by the apparent fit, like puzzle pieces, of the coastlines of South America and Africa. 【B】Wegener first presented his theory of continental drift at a meeting and in a paper, and then as a book. The Origin of Continents and Oceans, published in 1915. 【C】He continued to write updated versions of this work until his death in an ill-fated expedition to Greenland in 1930. 【D】Wegener maintained that Earth is composed of concentric shells of increasing density from crust to core. The outermost shell is not continuous but made of continental blocks of lighter rock called sial (an acronym for silica- and aluminum-rich rock) floating in the denser sima (silica- and magnesia-rich rock) underlying the oceans. All the continents had been joined in the supercontinent of Pangaea.

14. Alfred Wegener proposed the theory of continental drift to explain how continents and mountain ranges came into existence.

Answer Choices

A. Wegener revised his explanation of the process of continental drift from one based on planetary rotation and tides to one that involved convection.

B. Among geologists of the time, the work of Arthur Holmes was considered revolutionary but inconsistent with the theory of continental drift as explained by Wegener

C. Plant fossils discovered on a British expedition to the South Pole indicated that on the whole, Earth's temperature varied over time from hotter than it is today to colder than it is today

D. Wegener’ s major contribution to our current understanding of how Earth evolved its continental form was his development of the concept of Polfluchtkraft

E. The importance of Wegener's theory was its ability to explain both Earth’ s evolution and a wide range of seemingly odd geographical and biological phenomena

F. Evidence of inconsistencies in continental climates observed to have occurred over time or within a particular time makes sense if continents drifted away from the poles

Representative Government in Colonial North America

【Paragraph 1】Before 1750, colonists in North America had little occasion to think of themselves as a distinct people. There was no American government, no single political organization in which all the colonies joined to manage their common concerns. There was not even a wish for such an organization except among a few eccentric individuals America, to the people who lived in it, was still a geographic region, not a frame of mind.

【Paragraph 2】Asked about nationality, the typical American colonist of 1750 would have said English or British. In spite of substantial numbers of Dutch, Germans, and Scotch-Irish, English people and English institutions prevailed in every colony, and most colonists spoke of England as home even though they had never been there. Yet no American institutions were quite like their counterparts in England: the heritage of English ideas that went with these institutions was so rich and varied that colonists were able to select and develop those that best suited their situation and forget others that meanwhile were growing prominent in the mother country. This variety sometimes led to regional differences: in some ways New Englanders were set off from Virginians even more than from people in England. But some ideas, institutions, and attitudes became common in all the colonies and remained uncommon in England. Although colonial Englishmen were not yet aware that they shared these Americanisms with one another or that English people in England did not share them, many of the characteristic ideas and attitudes that later distinguished United States nationalism were already present by the mid-eighteenth century.

【Paragraph 3】English people brought with them to the New World the political ideas that still give English and American government a close resemblance. But American colonists very early developed conceptions of representative government that differed from those in England. Representative government in England originated in the Middle Ages, when the king called for men to advise him. They were chosen by their neighbors and informed the king of his subjects' wishes. Eventually, their advice became so compelling that the king could not reject it, and the representatives of the people, organized as a legislature known as the House of Commons, became the most powerful branch of the English government.

【Paragraph 4】At first, the House of Commons consisted of representatives from each county, or shire, and from selected boroughs. Over the centuries many of these boroughs became ghost towns with only a handful of inhabitants, and great towns sprang up where none had existed before. Yet the old boroughs continued to send members to the House of Commons, and the new towns sent none. Moreover, only a fraction of the English population could participate even in county elections. In order to vote, a man had to own property that would, if rented, yield him at least 40 shillings yearly. Few could meet the test. A number of English people thought the situation absurd and said so. But nothing was done to improve it; in fact, a theory was devised to justify it. A member of the House of Commons, it was said, represented not the people who chose him but the whole country, and he was not responsible for any particular constituency. Not all Englishmen could vote for representatives, but all were virtually represented by every member of the Commons.

【Paragraph 5】The assemblies of American colonial representatives were more democratic. Although every colony had property qualifications for voting, probably the great majority of adult white males owned enough land to meet them. Moreover, the system for apportioning representation was more balanced. New England colonies gave every town the right to send delegates to the legislature. Outside New England, the unit of representation was usually the county. The political organization of new counties and the extension of representation seldom kept pace with the rapid advance of settlement westward, but nowhere was representation so uneven or irrational as in England.

【Paragraph 6】American colonists knew nothing of virtual representation. A colonial representative was supposed to be an agent of the people who chose him. He was supposed to look after their interests first and those of the colony second. In New England, where town meetings could be called at any time, people often gathered to tell their delegate how to vote on a particular issue.

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

A. wise

B. unusual

C. ambitious

D. famous

2. According to paragraphs 1 and 2, all of the following were true of most English people living in the American colonies in 1750 EXCEPT:

A. They not feel the need for an American government for all the colonies.

B. They had never been to England.

C. They believed they had much in common with non-English colonists

D. They did not think of themselves as Americans.

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

A. remained

B. decreased

C. united

D. dominated

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

A. range

B. attraction

C. tradition

D. usefulness

5. According to paragraph 2, what is one reason that regional differences arose in the English colonies of North America?

A. Colonists selected and adapted English institutions to their particular needs

B. Colonists in each region wanted to distinguish their institutions from those of colonists elsewhere

C. The large number of German, Dutch, and Scotch-Irish colonists settling in some regions resisted political and social change

D. Colonists in different regions reacted differently to developments becoming prominent in England.

6. According to paragraph 2, what two things did English people living in America in 1750 fail to realize? To receive credit, you must select **TWO answers**.

A. Some of their beliefs were different from those of people in England

B. Some regional differences had developed among the English colonies in America.

C. Some of the colonial institutions had close counterparts in England

D. Some specifically American ideas had become commonplace in the colonies

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

A. Fashionable

B. forceful

C. helpful

D. clear

8. According to paragraph 3, how did representative government get started in England?

A. The king chose a representative group of people to inform him of his subjects' wishes

B. The king' s subjects chose a group of representatives in response to the king's request for advisors.

C. The king organized a legislature known as the House of Commons

D. A group of representatives of the people took power from the king and passed their own laws.

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

A. dangerous

B. illegal

C. inefficient

D. ridiculous

10. According to paragraph 4, what was the response to criticisms of representative government in England?

A. Efforts were made to make the system better

B. Criticisms of the system were completely ignored.

C. An explanation was created to defend the system

D. Critics of the system were widely viewed as unpatriotic.

11. Why does the author mention that "The political organization of new counties and the extension of representation seldom kept pace with the rapid advance of settlement westward, but nowhere was representation so uneven or irrational as in England" ?

A. To emphasize that, overall, the American colonial assemblies were more democratic than the assemblies of England

B. To explain why outside of New England the unit of political representation was the county rather than the town

C. To argue that while the political representation of the American colonies was irrational, it was still better than representation in England

D. To remind the reader that the American colonies showed the weaknesses as well as the strengths of England' s system of representation

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

This development occurred primarily for two reasons.

Where would the sentence best fit? Click on a square 【】 to add the sentence to the passage.

【Paragraph 5】The assemblies of American colonial representatives were more democratic. 【A】Although every colony had property qualifications for voting, probably the great majority of adult white males owned enough land to meet them. 【B】Moreover, the system for apportioning representation was more balanced. 【C】New England colonies gave every town the right to send delegates to the legislature. 【D】Outside New England, the unit of representation was usually the county. The political organization of new counties and the extension of representation seldom kept pace with the rapid advance of settlement westward, but nowhere was representation so uneven or irrational as in England.

13. Directions: Match the statements about representative government to the correct location. Two of the statements describe representative government in England ONLY, two describe representative government in the English colonies ONLY, and one describes BOTH England and the English colonies in America. One of the statements will NOT be used This question is worth 3 points.

Drag your answer choices to the spaces where they belong. To remove an answer choice, click on it.

	Answers
England ONLY	
English Colonies in America ONLY	
BOTH England and the English Colonies in America	

Answer Choices

A. Delegates to the legislature represented everyone, not just the people who elected them.

B. A person had to own property worth a certain amount to be able to elect delegates to the legislature.

C. Some large towns had no power to send delegates to the legislature.

D. A large majority of adult males in the population met the qualifications for voting

E. Counties could generally send more delegates to the legislature than could towns

F. In some places, citizens met to tell delegates how to vote on specific issues

Urban Heat Islands

【Paragraph 1】Climatic changes such as changes in temperature, precipitation, humidity, or wind speed that are produced by urbanization involve all major surface conditions. Some of these changes are quite obvious and relatively easy to measure. Others are more subtle and sometimes difficult to measure. The amount of change in any of these elements, at any time, depends on several variables, including the extent of the urban complex, the nature of industry, site factors such as topography and proximity to water bodies, time of day, and existing weather conditions.

【Paragraph 2】The most studied and well-documented urban climatic effect is the urban heat island. The term simply refers to the fact that temperatures within cities are generally higher than in rural areas. The heat island is evident when temperature data are examined. For example, the distribution of average minimum temperatures in the Washington, D C., metropolitan area for the three-month winter period (December through February) over a five-year span, clearly represents a well-developed heat island. The warmest winter temperatures occurred in the heart of the city, while the suburbs and surrounding countryside experienced average minimum temperatures that were as much as 3 3°C lower. Remember that these temperatures are averages, because on many clear, calm nights the temperature difference between the city center and the countryside was considerably greater, often 11°C or more. Conversely, on many overcast or windy nights the temperature differential approached zero degrees.

【Paragraph 3】The radical change in the surface that results when rural areas are transformed into cities is a significant cause of the urban heat island. First, the tall buildings and the concrete and asphalt of the city absorb and store greater quantities of solar radiation than do the vegetation and soil typical of rural areas. In addition, because the city surface is impermeable, the runoff of water following a rain is rapid, resulting in a severe reduction in the evaporation rate. Hence, heat that once would have been used to convert liquid water to a gas now goes to increase the surface temperature. At night, while both the city and the countryside cool by radiative losses, the stone-like surface of the city gradually releases the additional heat accumulated during the day, keeping the urban air warmer than that of the outlying areas.

【Paragraph 4】A portion of the urban temperature rise must also be attributed to waste heat from sources such as home heating and air conditioning, power generation, industry, and transportation. Many studies have shown that the magnitude of human-generated energy in metropolitan areas is great when compared to the amount of energy received from the Sun at the surface. For example, investigations in Sheffield, England, and Berlin, Germany, showed that the annual heat production in those cities was equal to approximately one-third of that received from solar radiation. Another study of densely built-up Manhattan in New York City revealed that during the winter, the quantity of heat produced by combustion alone was 2 times greater than the amount of solar energy reaching the ground. In summer, the figure dropped to 1/6.

【Paragraph 5】There are other, somewhat less influential, causes of the heat island. For example, the blanket of pollutants over a city contributes to the heat island by absorbing a portion of the upward-directed long-wave radiation emitted at the surface and re-emitting some of it back to the ground. A somewhat similar effect results from the complex three-dimensional structure of the city. The vertical walls of office buildings, stores, and apartments do not allow radiation to escape as readily as in outlying rural areas where surfaces are relatively flat. As the sides of these structures emit their stored heat, a portion is re-radiated between buildings rather than upward, and is therefore slowly dissipated. In addition to re-radiating the heat loss from the city, tall buildings also alter the flow of air. Because of the greater surface roughness, wind speeds within an urban area are reduced. Estimates from available records suggest a decrease on the order of about 25 percent from rural values. The lower wind speeds decrease the city’ s ventilation by inhibiting the movement of cooler outside air which, if allowed to penetrate, would reduce the higher temperatures of the city center.

1. The word “proximity” in the passage is closest in meaning to

A. Distribution

B. Contamination

C. Exposure

D. closeness

2. Paragraph 2 supports which of the following statements about the temperature data for the Washington, DC., area?

A. The data were limited to daytime temperatures

B. A pattern was noticeable in less than three months.

C. The data were limited to the city and not the surrounding suburbs

D. The data clearly demonstrated the presence of a heat island

3. What can be inferred from paragraph 2 about the phenomenon of the urban heat island?

A. It occurs in rural areas to the same extent as urban areas.

B. It is influenced by variations in weather

C. It increases the cloud cover over the city.

D. It produces a lot of wind at night.

4. According to paragraph 2, temperatures in the city and the surrounding areas are likely to be about the same

A. during the months of December through February

B. when averaged over a five-year span

C. on clear, calm nights

D. on cloudy, windy nights

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

A. impenetrable

B. impermanent

C. unnatural

D. uneven

6. Which of the following is NOT mentioned in paragraph 3 as a contributing cause of urban heat islands?

A. The effects of tall buildings and hard surfaces

B. The effects of vegetation on soil

C. The rapid runoff of water

D. The slow loss of nighttime heat

7. What can be inferred from paragraph 3 about rainwater in rural areas as compared to urban areas?

A. The evaporation rate of rainwater in rural areas is greater than it is in urban areas.

B. The runoff of rainwater is more rapid in rural areas than it is in urban areas.

C. Rural areas require more rainwater in order to cool down than urban areas do

D. Rural areas experience greater problems when rainwater evaporates than urban areas do.

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

A. amount

B. use

C. danger

D. accumulation

9. What purpose does paragraph 4 serve in the larger discussion of temperatures within urban areas?

A. To argue that certain urban areas produce more waste heat than others

B. To examine the impact of solar radiation on temperatures in large urban areas

C. To show how human-generated energy contributes to the urban heat island effect

D. To point out the rate at which urban heat islands have increased over time

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

【Paragraph 5】There are other, somewhat less influential, causes of the heat island. For example, the blanket of pollutants over a city contributes to the heat island by absorbing a portion of the upward-directed long-wave radiation emitted at the surface and re-emitting some of it back to the ground. A somewhat similar effect results from the complex three-dimensional structure of the city. The vertical walls of office buildings, stores, and apartments do not allow radiation to escape as readily as in outlying rural areas where surfaces are relatively flat. As the sides of these structures emit their stored heat, a portion is re-radiated between buildings rather than upward, and is therefore slowly dissipated.

A. Pollutants hanging over a city contribute to the urban heat island effect by forcing solar radiation directly upward from the surface of Earth

B. Air pollution contributes to rising temperatures in cities by reflecting a certain amount of radiation it has absorbed from Earth’ s surface back to Earth

C. Earth’ s surface absorbs long-wave radiation that is emitted by polluted air in Earth's atmosphere.

D. Earth sends some of the heat that it has absorbed into the air where it is then absorbed by pollutants.

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

A. controlled

B. diverted

C. dispersed

D. absorbed

12. According to paragraph 5, which of the following statements is true about air flowing through a city?

A. Its speed is comparable to that in the countryside.

B. The movement of air is reduced by urban buildings.

C. It allows the city to cool down thoroughly at night.

D. It penetrates most quickly in urban areas with the tallest buildings

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

This simple observation was first made in the early 1800s when an amateur meteorologist observed that central London was warmer than its outskirts, and the phenomenon was later studied more extensively.

Where would the sentence best fit? Click on a square 【】 to add the sentence to the passage.

【Paragraph 2】【A】The most studied and well-documented urban climatic effect is the urban heat island. 【B】The term simply refers to the fact that temperatures within cities are generally higher than in rural areas. 【C】The heat island is evident when temperature data are examined. 【D】For example, the distribution of average minimum temperatures in the Washington, D C., metropolitan area for the three-month winter period (December through February) over a five-year span, clearly represents a well-developed heat island. The warmest winter temperatures occurred in the heart of the city, while the suburbs and surrounding countryside experienced average minimum temperatures that were as much as 3 3°C lower. Remember that these temperatures are averages, because on many clear, calm nights the temperature difference between the city center and the countryside was considerably greater, often 11°C or more. Conversely, on many overcast or windy nights the temperature differential approached zero degrees.

14. Drag your answer choices to the spaces where they belong. To remove an answer choice, click on it.

The term urban heat island describes the increased temperatures found in large cities as compared to rural areas.

Answer Choices

A. Winter temperatures vary more in urban than in rural areas.

B. The construction of tall buildings and hard surfaces in cities contributes to the formation of heat islands.

C. The heat island effect is forcing some cities in Europe and North America to manage their levels of human-generated energy more carefully.

D. Neither the time of the day nor the time of the year have an impact on the occurrence and intensity of heat islands.

E. The energy generated by such human activities as creating power and heating and cooling homes and industry contributes to warming the climate of the city

F. Heat trapped by atmospheric pollution and restricted wind flow contributes to raising urban temperatures.