The Formation of Rainbows

Rainbows have fascinated observers for centuries. Long before scientists understood the physics of light, people regarded rainbows as mysterious signs in the sky. Modern science explains that a rainbow appears when sunlight passes through countless tiny water droplets suspended in the air. As the sunlight enters each droplet, it [1] refract and separates into the different colors that compose white light.

When the light is refracted, it spreads into a band of colors including red, orange, yellow, green, blue, and violet. After this separation occurs, the light reflects off the inner surface of the droplet and leaves the droplet at a slightly different angle. Because millions of droplets perform this process at the same time, observers see a broad arc of color across the sky. [2] This phenomenon is often visible after a rainstorm, when sunlight shines through lingering moisture in the atmosphere.

Scientists explain that each observer sees a slightly different rainbow. The droplets that create the colors visible to one person are not the same droplets producing the rainbow seen by another observer standing nearby. This occurs because the rainbow forms at a particular angle between the observer, the droplets, and the sun. [3] Consequently, the rainbow that one observer sees cannot be exactly the same as the one seen by another.

In addition, rainbows sometimes appear as double arcs. The second arc is produced when sunlight reflects twice inside each droplet before leaving it. Because of this additional reflection, the colors in the secondary rainbow appear reversed. The secondary rainbow is also [4] faint then the primary rainbow because more light escapes during the second reflection.

1.

A. NO CHANGE
B. refracts
C. refracting
D. refracted

2. Which choice provides the most logical transition?

A. NO CHANGE
B. However,
C. Therefore,
D. Meanwhile,

3. Which sentence best supports the paragraph?

A. NO CHANGE
B. Each droplet sends colored light toward observers positioned at a precise angle.
C. Many ancient cultures believed rainbows were supernatural bridges.
D. Rainbows appear most often during certain seasons of the year.

4- A. NO CHANGE
B. faint than
C. fainter than
D. most faint than

[5] Although the scientific explanation of rainbows is now well understood, the sight of a rainbow continues to inspire curiosity and wonder. Early natural philosophers attempted to explain the phenomenon through observation and reasoning. Over time, experiments with prisms and lenses revealed how white light can separate into multiple colors.

One important step toward understanding rainbows occurred when scientists studied the behavior of light passing through glass prisms. These experiments demonstrated that white light contains many different colors combined together. [6] This discovery helped scientists understand why water droplets in the atmosphere can produce a similar effect.

Rainbows also provide insight into the properties of light itself. By analyzing the angles at which the colors appear, scientists have learned how light behaves when it interacts with transparent materials such as water or glass. [7] These studies have contributed to the development of modern optics.

Although rainbows may appear simple, they reveal complex interactions between light and water droplets in the atmosphere. [8] it's curved shape results from the geometry of light reflecting and refracting within spherical droplets.

5. Which choice provides the most relevant introduction to this paragraph?

A. NO CHANGE
B. Throughout history, people have attempted to explain the appearance of rainbows.
C. Rainbows are commonly seen in paintings and photographs.
D. Weather patterns vary greatly across different regions of the world.

6. Which option provides the most logical transition?

A. NO CHANGE
B. Similarly,
C. Nevertheless,
D. Consequently,

7. The writer is considering inserting the following sentence here:

"Optics is the branch of science that studies the behavior of light."

Should the writer make this insertion?

A. Yes, because it provides an unrelated historical fact.
B. Yes, because it clarifies a term introduced in the previous sentence.
C. No, because it contradicts the explanation of rainbows.
D. No, because the sentence repeats information already stated.

8- A. NO CHANGE
B. Its'
C. Its
D. Their

Rainbows generally appear when the sun is low in the sky and rain is falling in the opposite direction. Under these conditions, sunlight can enter droplets at the proper angle to produce the colorful arc visible from the ground. [9] observers must stand with their backs to the sun in order to see the rainbow clearly.

Even though rainbows can be explained scientifically, their beauty continues to capture human imagination. Many writers, artists, and scientists have described the rainbow as one of nature's most striking displaying. [10] the scientific explanation enhances rather than diminishes the wonder of the phenomenon. Understanding the science behind rainbows allows people to appreciate both their beauty and the natural processes that create them. [11] Scientists continue to study atmospheric phenomena in order to better understand the interactions between light, water, and air.

9-A. NO CHANGE
B. In contrast,
C. Therefore,
D. Nevertheless,

10- A. NO CHANGE
B. displayed
C. displays
D. display

11- A. NO CHANGE
B. Scientists continue to study atmospheric phenomena; in order to better understand the interactions between light, water, and air.
C. Scientists continue to study atmospheric phenomena, in order to better understand the interactions between light, water, and air.
D. Scientists continue to study atmospheric phenomena in order to better understand the interactions between light water and air.

Questions 12–23 are based on the following passage.

(1) On a bright Saturday morning in the small town of St. Petersburg, Tom Sawyer stood reluctantly beside a long wooden fence. (2) [12] The fence stretched for nearly thirty yards and stood nine feet high, presenting what seemed to Tom an enormous obstacle. (3) While other boys ran freely through the streets enjoying the warm morning, Tom had been assigned the unpleasant task of whitewashing the fence. (4) With a heavy sigh, he dipped the brush into the bucket and spread a thin coat of paint across the boards. [13]

Tom paused and examined his progress with a dissatisfied expression. The work seemed endless, and the quiet street offered little distraction. Soon, however, he heard footsteps approaching and noticed another boy walking down the road with cheerful confidence. Tom quickly realized that if he continued working in silence, the boy would surely mock him for spending the day painting a fence. Determined to avoid embarrassment, Tom adopted an expression of careful concentration and began painting as if the task were [14] tedious and tiresome.

When the boy approached, Tom continued working without looking up. He moved the brush carefully across the wood as though every stroke required deep consideration. The newcomer watched him for a moment before laughing and asking whether Tom had been forced to spend the entire day painting. Tom replied calmly that he was not sure it was really work at all. Few boys, he suggested, had the chance [15] to painting such a fine fence.

12-A. NO CHANGE
B. The fence stretched for nearly thirty yards and stood nine feet high presenting what seemed to Tom an enormous obstacle.
C. The fence stretched for nearly thirty yards, and stood nine feet high presenting what seemed to Tom an enormous obstacle.
D. The fence stretched for nearly thirty yards and stood nine feet high; presenting what seemed to Tom an enormous obstacle.

13-To make the paragraph more logical, sentence 4 should be placed

A. Where it is now.
B. Before sentence 1.
C. Before sentence 2.
D. Before sentence 3.

14-Which word would best fit the context?

A. NO CHANGE
B. fascinating and delightful
C. extremely important
D. an artistic performance

15-A. NO CHANGE
B. of painting
C. to paint
D. for painting

The boy looked uncertain and stepped closer to examine the fence. Tom continued brushing the boards with deliberate care, occasionally stepping back to inspect the results of his effort. [16] A boy who had previously mocked Tom for working now began to suspect that the task, might be more interesting than he had assumed. Before long, the boy offered Tom an apple in exchange for the chance to try painting the fence himself. [17]

Before long, several boys stood eagerly waiting for their turn to paint. [18] Tom accepted small treasures from them—apples, marbles, and pieces of string—in exchange for allowing them to do the work he had been assigned. What had begun as a punishment gradually became an opportunity for Tom to collect a surprising assortment of valuable items. More importantly, the boys [19] avoided the suspicion that Tom had cleverly transformed his chore into a profitable enterprise.

19-Which word would be best suited for the context?

A. NO CHANGE
B. escaped
C. detected
D. discovered

16-A. NO CHANGE
B. A boy, who had previously mocked Tom for working, now began to suspect that the task might be more interesting than he had assumed.
C. A boy who had previously mocked Tom for working now began to suspect that the task might be more interesting than he had assumed.
D. A boy who had previously mocked Tom for working; now began to suspect that the task might be more interesting than he had assumed.

17-Which sentence would best conclude the paragraph?

A. Tom immediately admitted that the work was dull and exhausting.
B. Soon other boys gathered nearby, curious about the unusual scene.
C. The fence was built several years earlier by the town carpenter.
D. The weather remained warm throughout the afternoon.

18-Which choice provides the best combination of the underlined sentences?

A-Tom accepted small treasures from them—apples, marbles, and pieces of string—in exchange for allowing them to do the work he had been assigned.
B. Tom accepted small treasures from them, apples marbles and pieces of string in exchange for allowing them to do the work he had been assigned.
C. Tom accepted small treasures from them apples, marbles, and pieces of string, in exchange for allowing them to do the work he had been assigned.
D. Tom accepted small treasures from them; apples, marbles, and pieces of string in exchange for allowing them to do the work he had been assigned.

By the afternoon, the once unfinished fence shone with several fresh layers of paint. Meanwhile, Tom sat comfortably nearby examining the various objects he had received during the day. Observing his success, one might have concluded that Tom [20] <u>have started</u> the morning with a clever plan rather than an unpleasant chore. [21] <u>What began as a simple punishment had been transformed through imagination and persuasion into an unexpected advantage?</u> Tom [22] <u>discovered</u> that when a task appears desirable, others may compete eagerly for the chance to perform it. [23]	20-A. NO CHANGE B. has started C. started D. had started 21 A- NO CHANGE B. What began as a simple punishment had been transformed through imagination and persuasion into an unexpected advantage. C. What began as a simple punishment had been transformed through imagination and persuasion into, an unexpected advantage. D. What began as a simple punishment had been transformed through imagination, and persuasion into an unexpected advantage. 22- A- NO CHANGE B. have discovered C. discovers D. Had discovered 23-The writer wants to conclude the passage by emphasizing Tom's clever insight about human behavior. Which choice best accomplishes this aim? A. Many fences in the town were painted each year during the summer months. B. Tom realized that people often desire things that appear rare or difficult to obtain. C. Painting fences was considered an important responsibility for young boys. D. The boys soon forgot about the fence and went back to playing games.

The Rise of Digital Communities

Before the expansion of the internet in the late twentieth century, communities were defined largely by geography. People formed social bonds through neighborhoods, workplaces, and local institutions. With the growth of online communication, however, individuals increasingly began to identify [24] themselves with communities that existed primarily in digital spaces.

Online forums, social networks, and collaborative platforms allow people to connect with others who share specific interests or goals. The appeal of these spaces often lies in the sense of belonging they produce. When individuals participate in these communities, they frequently develop [25] emotional connections not only with the ideas being discussed but also with the other members involved in the discussion.

[26] Thus digital platforms, like traditional community institutions, create environments where people experience a shared identity. Members exchange information, celebrate achievements, and sometimes even coordinate collective actions. In many cases, the sense of solidarity formed online can be as powerful as the bonds formed through physical interaction.

At the same time, digital communities differ from traditional ones in several ways. Because communication occurs through written messages, images, or recorded media, participants may interpret ideas differently depending on their own experiences. [27] This flexibility of interpretation allowing individuals to shape the meaning of discussions in ways that reflect their own interests and values.

Digital participation also gives individuals the opportunity to express opinions that might otherwise remain unspoken. Some people feel more comfortable sharing ideas online because the environment provides a degree of distance from face-to-face interaction. [28] Nevertheless, online

24.
A. NO CHANGE
B. themself
C. theirselves
D. itself

25.
A. NO CHANGE
B. mechanical
C. distant
D. emotionally

26.
A. NO CHANGE
B. Thus, digital platforms like traditional community institutions create environments where people experience a shared identity.
C. Thus digital platforms like traditional community institutions create environments, where people experience a shared identity.
D. Thus, digital platforms, like traditional community institutions create environments where people experience a shared identity.

27.
A. NO CHANGE
B. This flexibility of interpretation, allow individuals to shape the meaning of discussions in ways that reflect their own interests and values.
C. This flexibility of interpretation allows individuals to shape the meaning of discussions in ways that reflect their own interests and values
D. This flexibility of interpretation allow individuals to shape the meaning of discussions in ways that reflect their own interests and values.

28.
A. NO CHANGE
B. Consequently
C. As a result
D. Similarly

communication often becomes a space where personal viewpoints can be explored more freely than in many offline situations.

Another notable feature of digital communities is the way they influence people's perception of time and attention. Notifications, messages, and updates arrive continuously, encouraging users to check their devices frequently. This constant flow of information can make each moment of online interaction feel immediate and engaging, even when the discussion itself develops gradually over time. For many individuals, participation in these environments becomes part of their everyday routine, particularly during periods of life when social identity is still forming.

[29] For younger users especially, digital communication provides a way to experiment with ideas, interests, and social roles. In this sense, online participation can shape how individuals understand themselves within a larger cultural environment.

Yet this influence does not mean that digital communities replace traditional forms of social connection. Rather, they expand the range of **[30]** possible interactions available to individuals. People may maintain relationships with friends and family offline while also participating in global conversations online.

Participation in online communities often occurs during adolescence and early adulthood, periods when individuals are especially attentive to questions of identity and belonging. At these stages of life, people frequently experiment with different forms of communication and self-presentation. Digital environments provide a convenient setting for this exploration.

Youth, therefore, can be understood partly through its **[31]** relating with emerging technologies. Experiences shared through digital platforms often shape memories and social connections in powerful ways. These interactions may produce both

29. Which choice best introduces the paragraph?
A. NO CHANGE
B. Many teenagers use digital devices every day for entertainment purposes.
C. Young people rarely use digital platforms to communicate with others.
D. Some adults prefer traditional newspapers instead of online sources.

30. Which wording best fits the meaning of the sentence?
A. indifference
B. stability
C. hesitation
D. excitement

31.
A. NO CHANGE
B. relationships
C. relations
D. relationship

excitement about the future and nostalgia for the rapidly changing present. This mixture of anticipation and reflection illustrates how communication technologies influence the perception of social experience. As individuals engage with digital networks, they simultaneously define **[32]** themself and contribute to broader cultural conversations. [33] **[34]** this dynamic process highlights the evolving nature of modern social interaction. **[35]** individuals define themselves and contribute to broader cultural conversations.	**32.** A. NO CHANGE B. them C. themselves D. itself **33. Which sentence would best conclude the passage?** A. Digital communities show how technology reshapes identity, communication, and social belonging. B. Technology has replaced all traditional forms of community interaction. C. Digital platforms are mainly used for entertainment rather than communication. D. Social relationships are less important today than in previous generations. **34. Which transition would best begin the final paragraph?** A. Similarly B. However C. Finally D. Meanwhile **35. Which option uses the most appropriate punctuation?** A. NO CHANGE B. —individuals define themselves, and contribute to broader cultural conversations. C. —individuals define themselves and contribute to broader cultural conversations. D. ; individuals define themselves and contribute to broader cultural conversations.

The Ruins of Yucatan and the Labors of Dr. Le Plongeon

The most striking remains of an advanced early civilization in the Americas are found not in the regions most familiar to European historians, but in the ruined cities of Central America. While Spanish chroniclers of the sixteenth century recorded with wonder the splendor of indigenous societies, their testimony is now supplemented—and in many respects surpassed—by the enduring evidence of stone. Throughout the peninsula of Yucatan and neighboring territories of Guatemala, Chiapas, and Tabasco stand the remains of magnificent structures built of carefully hewn stone, many adorned with intricate bas-reliefs and hieroglyphic inscriptions. These ruins, preserved through centuries of tropical climate and neglect, offer direct and compelling proof of a highly organized and artistically accomplished people.

In Mexico proper, much of the architectural heritage that impressed the companions of Cortés was later destroyed or obscured. The thorough subjugation of the region, combined with continuous occupation and rebuilding, effaced many earlier monuments. It is also probable that some Mexican constructions relied more heavily on less durable materials. By contrast, the cities of Yucatan have remained, in large measure, silent but eloquent witnesses to the past. Their temples, terraces, and sculptured façades command admiration and invite systematic study.

The world's knowledge of these ruins was first widely extended through the publications of explorers and antiquarians such as Waldeck, Stephens, Charnay, and Brasseur de Bourbourg. Yet for a period following their investigations, little additional research was undertaken. Renewed interest emerged in 1873, when Dr. Augustus Le Plongeon, accompanied by his wife, Mrs. Alice Dixon Le Plongeon, began a sustained examination of the ruins of Yucatan. Drawn by the opportunity for archaeological inquiry, they undertook extensive exploration, photographing structures, drafting architectural plans, and conducting excavations.

Dr. Le Plongeon's efforts resulted in the recovery of a remarkable statue at Chichen-Itza, commonly known as "Chac-Mool." This sculpture, distinct from previously identified examples of indigenous American art, attracted considerable attention within scholarly circles. In addition to this discovery, the Le Plongeons produced a collection of 137 photographic views documenting ruins, hieroglyphics, and sculptural details from sites including Uxmal, Aké, and Chichen-Itza. These images provided scholars, many of whom could not travel to the region, with invaluable visual records of monuments that might otherwise remain inaccessible or subject to decay.

The career of Dr. Le Plongeon reflects unusual perseverance. Educated in Paris and initially engaged in engineering work in California, he later traveled in Peru, where he photographed ancient ruins. His transition to archaeology was marked by personal risk and hardship. Residence in tropical regions exposed him to climatic dangers and logistical challenges. Nevertheless, his enthusiasm and determination sustained prolonged investigation in areas then remote and, at times, politically unstable.

Among his additional discoveries were fragments of a plaster idol unearthed on the island of Mugeres. Though the statue was damaged during its removal, surviving portions—particularly the head and feet—were considered by Dr. Le Plongeon to possess both artistic and historical significance. He argued that certain features, including filed teeth and sandal forms, suggested cultural connections extending beyond the immediate region. Whether such interpretations will endure further scholarly scrutiny remains to be determined; yet the artifacts themselves undeniably enrich the material record of pre-Columbian art.

Today, many of the ruins along the Yucatecan coast face gradual erosion from natural forces. Shrines built upon cliffs are threatened by encroaching seas, and structures long concealed beneath vegetation risk irreversible loss. In this context, the documentation and preservation efforts of early explorers acquire heightened importance. The labors of Dr. and Mrs. Le Plongeon, whatever debates they may have inspired, contributed significantly to the systematic study of Central American antiquity and to the broader understanding of early civilization on this continent.



1. Which statement best expresses the central idea of the passage?
A. Spanish chronicles remain the primary source for understanding early American civilization.
B. The ruins of Yucatan provide strong material evidence of an advanced early civilization.
C. Mexican architecture surpassed that of neighboring regions in both scale and durability.
D. Archaeological photography replaced excavation as the most reliable method of study.

2. The author contrasts Mexico with Yucatan primarily to
A. explain why fewer ancient structures remain visible in central Mexico today.
B. demonstrate that Mexican civilization lacked artistic architectural refinement.
C. argue that Spanish writers exaggerated descriptions of Mexican cities.
D. suggest that climate alone determined the survival of monuments.

3. As used in the passage, the word "subjugation" most nearly means
A. organized migration and cultural blending with colonists.
B. complete conquest and political domination by force.
C. peaceful alliance formed through diplomatic agreement.
D. gradual economic transformation under foreign trade.

4. Which detail best supports the claim of early advancement?
A. Chroniclers described magnificent temples and crowded marketplaces.
B. Explorers recorded travel hardships in tropical forests.
C. Stone buildings were carved with hieroglyphics and intricate reliefs.
D. Wooden dwellings once stood beside ceremonial platforms.

5. The author mentions earlier explorers primarily to
A. criticize their exaggerated and romantic interpretations.
B. show that modern archaeology has corrected their mistakes.
C. acknowledge their role in revealing the ruins to scholars.
D. suggest that their work lacked scientific discipline.

6. Which inference can reasonably be drawn about Dr. Le Plongeon?
A. He relied exclusively on institutional funding and government protection.
B. He focused solely on collecting artifacts for private sale.
C. He avoided personal risk by delegating excavation to assistants.
D. He combined technical skill with determination in field research.

7. The discussion of the statue "Chac-Mool" mainly serves to
A. demonstrate uniform patterns in all indigenous American sculpture.
B. highlight the importance of Dr. Le Plongeon's discoveries.
C. minimize the significance of photographic documentation.
D. question whether the statue truly originated in Yucatan.

8. The author's tone toward the Le Plongeons is best described as
A. skeptical and doubtful of their scholarly conclusions.
B. respectful and appreciative of their persistent efforts.
C. indifferent to the value of their discoveries.
D. critical of their speculative historical theories.

9. Which best describes the passage's overall organization?
A. A chronological account of Spanish exploration and conquest.
B. A personal memoir detailing daily excavation routines.
C. A debate between competing interpretations of artifacts.
D. A description of ruins followed by modern archaeological work.

10. As used in the final paragraph, "erosion" most nearly suggests
A. deliberate destruction carried out by rival investigators.
B. gradual natural deterioration caused by environmental forces.
C. sudden structural collapse from military conflict.
D. removal of artifacts by national authorities.

11. The inclusion of cultural connection theories primarily serves to
A. illustrate the broader interpretations of the discoveries.
B. establish them as universally accepted historical facts.
C. disprove all earlier explanations of Mayan symbolism.
D. demonstrate that the artifacts were recently fabricated.

12. Based on both the passage and the image, which conclusion is most strongly supported?
A. The ruins consist mainly of undecorated defensive stone structures.
B. The carvings were created during the Spanish colonial era.
C. The civilization possessed advanced sculptural skill and symbolic artistry.
D. The reliefs served primarily as practical construction markers.

The History of Vaccination: From Experiment to Public Health Triumph

Few medical advances have altered the course of human history as profoundly as vaccination. Long before the mechanisms of immunity were understood, societies sought methods to protect themselves from devastating infectious diseases. The evolution of vaccination reflects a gradual transformation—from empirical observation and risky experimentation to systematic scientific practice and global public health policy.

The earliest known efforts to induce immunity date back centuries before modern medicine. In parts of China, India, and the Ottoman Empire, a practice known as variolation was employed to prevent smallpox. This method involved deliberately exposing a healthy person to material taken from a smallpox patient, often by inserting dried scabs or fluid from lesions into superficial cuts in the skin. Although variolation carried significant risks—including the possibility of severe infection—it was generally less deadly than contracting smallpox naturally. For communities ravaged by recurrent epidemics, even partial protection was considered a remarkable achievement.

The decisive breakthrough occurred in 1796, when the English physician Edward Jenner observed that milkmaids who had contracted cowpox—a relatively mild disease—appeared immune to smallpox. To test his hypothesis, Jenner inoculated a young boy with material from a cowpox sore and later exposed him to smallpox. The boy did not develop the disease. Jenner's method, which he termed "vaccination" from the Latin word *vacca* (cow), proved far safer than variolation and gradually gained acceptance across Europe and beyond. Despite initial skepticism and resistance, vaccination campaigns expanded during the nineteenth century, supported by growing confidence in scientific medicine.

The development of germ theory in the late nineteenth century further strengthened vaccination efforts. Scientists such as Louis Pasteur demonstrated that specific microorganisms caused particular diseases, providing a theoretical foundation for immunization. Pasteur and others extended the principle of vaccination to diseases such as rabies and anthrax by using weakened or inactivated pathogens to stimulate the immune system without causing severe illness. This shift from empirical practice to laboratory-based science marked a turning point in preventive medicine.

During the twentieth century, vaccination programs expanded dramatically. Advances in microbiology, biochemistry, and mass production enabled the creation of vaccines against diseases including diphtheria, tetanus, polio, measles, and influenza. Perhaps the most celebrated achievement was the global eradication of smallpox in 1980, following a coordinated international vaccination campaign led by the World Health Organization. Smallpox remains the only human disease to have been eliminated worldwide, illustrating the power of sustained immunization efforts.

Yet the history of vaccination has not been without controversy. Public resistance has periodically emerged, often fueled by concerns about safety, personal liberty, or mistrust of medical authorities. In the nineteenth century, compulsory vaccination laws sparked protests in several countries. In more recent decades, misinformation regarding vaccine safety has contributed to declines in immunization rates in certain regions. These episodes reveal that scientific progress alone does not guarantee public acceptance; trust, communication, and education remain essential components of successful health policy.

In the twenty-first century, vaccination continues to evolve. The rapid development of vaccines using new technologies, including messenger RNA platforms, demonstrates the ongoing capacity of science to respond to emerging diseases. At the same time, global disparities in vaccine access highlight persistent inequalities in health resources.

The history of vaccination thus illustrates both scientific ingenuity and social complexity. From early variolation practices to modern biotechnology, vaccination has transformed once-fatal epidemics into preventable conditions. Its continued success depends not only on laboratory innovation but also on collective responsibility and informed public cooperation.

13. The author's discussion of variolation in paragraph 2 primarily serves to
A. criticize early preventive measures as reckless and scientifically unreliable practices.
B. demonstrate that organized attempts at disease prevention existed before modern science.
C. argue that traditional healing systems were superior to laboratory-based medicine.
D. suggest that smallpox mortality rates were overstated by historical observers.

14. As used in paragraph 2, the word *ravaged* most nearly means
A. mildly affected by limited and manageable outbreaks of illness.
B. temporarily inconvenienced by isolated medical disruptions.
C. gradually influenced by moderate environmental conditions.
D. severely devastated by repeated and destructive epidemic disease.

15. Which of the following best explains why Jenner's experiment marked a turning point, as described in paragraph 3?
A. It introduced a safer immunization method than earlier variolation practices.
B. It eliminated the necessity for organized public health interventions.
C. It demonstrated that all infectious diseases could be cured immediately.
D. It replaced careful observation with speculative medical reasoning.

16. The reference to the Latin word *vacca* in paragraph 3 primarily functions to
A. emphasize the agricultural background of European scientific inquiry.
B. undermine skepticism about emerging scientific terminology.
C. imply that cowpox posed greater danger than smallpox infection.
D. provide historical context for the origin of the term vaccination.

17. As used in paragraph 4, the word *empirical* most nearly means
A. based on systematic observation and practical experimental evidence.
B. imposed by official authority without supporting scientific proof.
C. derived entirely from abstract theoretical speculation.
D. influenced primarily by religious doctrine and tradition.

18. In paragraph 4, the mention of germ theory most strongly supports which claim?
A. Vaccination remained controversial even within scientific communities.
B. Laboratory research immediately replaced earlier preventive customs.
C. Scientific understanding provided theoretical support for immunization practices.
D. Microorganisms were identified long before vaccination began.

19. The example of smallpox eradication in paragraph 5 primarily serves to
A. acknowledge that complete elimination of disease is rarely achievable.
B. suggest that twentieth-century medicine depended solely on global agencies.
C. demonstrate the effectiveness of coordinated international vaccination campaigns.
D. argue that smallpox was less severe than historically believed.

20. (Vocabulary – paragraph 6) As used in paragraph 6, the word *compulsory* most nearly means
A. strongly recommended though not legally required by authorities.
B. experimentally adopted without public consultation.
C. informally accepted within certain social communities.
D. legally mandated and enforced through government policy.

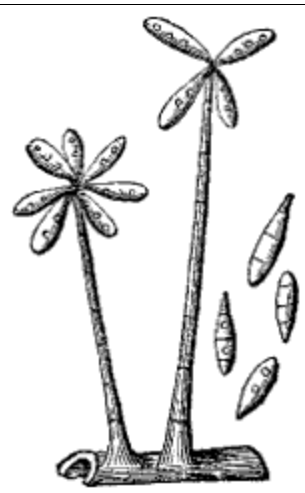
21. The discussion of public resistance in paragraph 6 primarily emphasizes that
A. scientific progress alone does not guarantee public trust or acceptance.
B. safety concerns regarding vaccines have consistently been validated.
C. government mandates always succeed in building public confidence.
D. opposition movements permanently halted vaccination efforts worldwide.

22. Which statement best captures the author's perspective on modern vaccine development in paragraph 7?
A. New technologies have entirely replaced traditional immunization methods.
B. Scientific innovation continues, yet global access remains unequal.
C. Contemporary vaccines face no ethical or logistical challenges.
D. Modern research has resolved all controversies surrounding immunization.

23. The overall structure of the passage is best described as
A. a chronological progression tracing developments from early practices to modern science.
B. a comparison between Western and non-Western medical traditions.
C. a critical evaluation of competing theories regarding immunity.
D. a personal narrative recounting experiences of medical pioneers.

24. The author's tone throughout the passage is best characterized as
A. skeptical toward the long-term effectiveness of vaccination policies.
B. celebratory yet dismissive of social and ethical complexities.
C. analytical and balanced, acknowledging achievements and challenges.
D. emotional and persuasive, urging immediate legislative reform.

25. Which of the following best expresses the central thesis of the passage?
A. Vaccination emerged solely through accidental discoveries without scientific method.
B. The history of vaccination reflects both scientific progress and social negotiation.
C. Modern biotechnology has rendered earlier immunization principles obsolete.
D. Public health policy has always operated independently of scientific research.

The **wind dispersal**, a method of seed distribution in which plants rely on air currents to spread their offspring. The tall stems elevate the seeds, allowing them to be released from a greater height. The lightweight, winged or feathery structures attached to the seeds increase surface area, enabling them to be carried away by the wind. As the wind blows, the seeds detach from the parent plant and drift through the air before landing at a distance. This process reduces competition for sunlight, water, and nutrients between the parent plant and its seedlings. Wind dispersal is common among plants that produce small, light seeds specially adapted for flight.	

1. What is the primary function of the tall stems shown in the image?

A. To strengthen the plant against strong winds
B. To protect seeds from animals and harsh weather
C. To store nutrients needed during seed development
D. To release seeds higher for wider wind distribution

2. How do the lightweight, feathery seed structures assist dispersal?

A. They reduce moisture loss during seed travel
B. They increase surface area for wind transport
C. They help seeds absorb additional sunlight
D. They protect seeds from physical damage

3. Why is wind dispersal advantageous for the parent plant?

A. It reduces competition for essential resources
B. It prevents seeds from premature development
C. It guarantees germination near the parent plant
D. It ensures synchronized seasonal growth

Natural Observation
adapted from *Walden* by Henry David Thoreau (Project Gutenberg)

[1] Many people walk through forests without noticing the small changes that occur among plants and animals.

[2] A patient observer, however, may discover patterns in nature that remain hidden from casual visitors.

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4. Which revision of sentence 1 is the most grammatically correct?

A. Many people walk through forests without noticing small changes occurs among plants and animals.

B. Many people walking through forests without noticing small changes occurring among plants and animals.

C. Many people walks through forests without noticing small changes occurring among plants and animals.

D. Many people walk through forests without noticing small changes occurring among plants and animals.

---

5. As used in sentence 2, "patient" most nearly means

A. willing to wait carefully while observing details over time

B. unable to notice changes that occur slowly in nature

C. concerned about the health of forest plants and animals

D. interested mainly in visiting forests for recreation

Scientific Curiosity
adapted from *The Advancement of Science* by Thomas Huxley (Project Gutenberg)

[1] Scientific discovery often begins with simple curiosity about natural phenomena. [2] Researchers who ask careful questions about ordinary events sometimes uncover important scientific principles.

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6. Which word best replaces "ordinary" in sentence 2?

A. familiar events observed frequently in everyday environments

B. unusual events observed rarely in everyday environments

C. distant events observed occasionally in unfamiliar locations

D. unexpected events observed suddenly during scientific experiments

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7. What is the main idea of the passage?

A. Scientific discoveries occur mainly through expensive laboratory research programs.

B. Curiosity about everyday observations can lead to important scientific discoveries.

C. Scientific research depends mainly on complex technology and instruments.

D. Researchers usually avoid studying common events in natural environments.

Division of Labor
adapted from *The Wealth of Nations* by Adam Smith (Project Gutenberg)

[1] In early societies individuals produced most goods they needed for daily life.
[2] As communities developed, workers began specializing in particular tasks.
[3] This division of labor allowed industries to produce goods more efficiently.

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8. Which revision of sentence 2 is the most grammatically correct?

A. workers began specializing in particular tasks within growing communities

B. workers began specialize in particular tasks within growing communities

C. workers begins specializing in particular tasks within growing communities

D. workers beginning specialize in particular tasks within growing communities

---

9. Which transition best begins sentence 3?

A. Similarly

B. However

C. Therefore

D. Meanwhile

10. What is the central idea of the passage?

A. Early societies relied primarily on agriculture for economic production.

B. Industrial development depends entirely on technological machinery.

C. Specialization of labor increases efficiency in producing goods.

D. Workers prefer performing different tasks throughout each day.

Ocean Exploration
adapted from *The Voyage of the Beagle* by Charles Darwin (Project Gutenberg)

[1] For many centuries the depths of the ocean remained mysterious to human observers. [2] Modern scientific instruments have allowed researchers to explore regions once unreachable.

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11. As used in sentence 2, "unreachable" most nearly means

A. impossible for researchers to access using available scientific technology

B. difficult for marine animals to survive within ocean environments

C. unlikely for explorers to discover during early scientific expeditions

D. unnecessary for scientists to study during modern research programs

---

12. What can reasonably be inferred from the passage?

A. Scientists fully understood deep oceans before modern technology existed.

B. Ocean exploration increased after scientists developed new research tools.

C. Marine animals cannot survive in deep ocean environments.

D. Deep ocean environments contain very little scientific interest.

The Influence of Language
adapted from *The Philosophy of Style* by Herbert Spencer (Project Gutenberg)

[1] Language allows individuals to communicate complex ideas to other people.
[2] When language is clear readers understand ideas more easily.

13. Which revision of sentence 2 is most grammatically correct?

A. When language is clear readers understand ideas more easily.

B. When language is clear readers, understand ideas more easily.

C. When language is clear, readers understand ideas more easily.

D. When language is clear readers understand, ideas more easily.

---

14. What is the main idea of the passage?

A. Writers often avoid explaining ideas clearly in written texts.

B. Readers prefer texts containing complicated language structures.

C. Language helps individuals communicate ideas effectively to others.

D. Language prevents readers from understanding complex ideas.

---

15. Which statement best supports the author's claim?

A. Readers often enjoy texts containing complex vocabulary words.

B. Clear language allows readers to interpret ideas without confusion.

C. Writers sometimes include technical terms within academic writing.

D. Language systems vary widely between cultures and societies.

Urban Transportation
adapted from *Anticipations* by H. G. Wells (Project Gutenberg)

[1] Modern cities depend heavily on transportation networks connecting different districts.
[2] Railways, roads, and public transit allow residents to travel efficiently.

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16. Which revision of sentence 1 is the most grammatically correct?

A. Modern cities depends heavily on transportation networks connecting districts.

B. Modern cities depend heavily on transportation networks connecting districts.

C. Modern cities depending heavily on transportation networks connecting districts.

D. Modern cities depend heavily on transportation networks connects districts.

---

17. What is the central idea of the passage?

A. Cities function efficiently without organized transportation systems.

B. Modern cities rely primarily on agricultural production systems.

C. Urban transportation mainly benefits visitors traveling between cities.

D. Transportation networks are essential for movement within modern cities.

---

18. Which detail best supports the passage's claim?

A. Travelers sometimes visit cities during different seasons.

B. Cities contain residential districts with many different buildings.

C. Roads often connect cities with nearby rural communities.

D. Public transit systems allow residents to travel efficiently across cities.

Scientific Progress
adapted from *The Outline of Science* by J. Arthur Thomson (Project Gutenberg)

[1] Scientific knowledge develops gradually through observation and experimentation.
[2] Each discovery builds upon earlier investigations conducted by researchers.

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19. Which word best replaces "gradually" in sentence 1?

A. slowly through careful observation and repeated experimentation

B. suddenly through unexpected discoveries during scientific research

C. rarely through occasional experiments conducted by researchers

D. immediately through complete understanding of natural phenomena

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20. What is the main idea of the passage?

A. Scientific discoveries occur suddenly without earlier investigation.

B. Scientific knowledge grows gradually through research and evidence.

C. Scientists depend mainly on intuition rather than experimentation.

D. Scientific explanations remain unchanged once discovered.

---

21. Which statement best supports the author's argument?

A. Universities frequently support scientific research programs.

B. Scientific experiments require specialized equipment in laboratories.

C. Researchers often rely on earlier discoveries when forming new explanations.

D. Scientists often collaborate with researchers in different countries.

Historical Inquiry
adapted from *The Study of History* by Edward Freeman

[1] Historians attempt to understand past events by examining documents and artifacts.
[2] By comparing different sources they develop explanations for historical change.

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22. Which revision of sentence 2 is most grammatically correct?

A. By comparing different sources historians develop explanations for historical changes.

B. By comparing different sources historians develop explanations for historical change.

C. By comparing different sources, historians develop explanations for historical change.

D. By comparing different sources historians develops explanations for historical change.

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23. As used in sentence 1, “artifacts” most nearly means

A. objects created by humans that provide evidence about past societies

B. documents written by historians explaining historical events

C. buildings constructed by governments during historical periods

D. discoveries made by scientists studying natural environments

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24. What can reasonably be inferred from the passage?

A. Historical explanations never change once they are established.

B. Historical research focuses mainly on memorizing important dates.

C. Historians rarely analyze original documents when studying history.

D. Historians rely on multiple types of evidence when studying past events.

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25. Which sentence best concludes the paragraph?

A. Archaeologists often discover objects while excavating ancient cities related to different societies.

B. Many historical events occurred during periods of political conflict.

C. Different societies developed unique cultural traditions throughout history.

D. Through careful analysis historians gradually understand how societies changed over time.

M1	M2	M3
1. B 2. A 3. B 4. C 5. B 6. D 7. B 8. C 9. A 10. D 11. A 12. A 13. A 14. B 15. C 16. C 17. B 18. A 19. B 20. D 21. B 22. D 23. B 24. A 25. A 26. B 27. C 28. C 29. A 30. D 31. D 32. C 33. A 34. C 35. C	Answers 1. B 2. A 3. B 4. C 5. C 6. D 7. B 8. B 9. D 10. B 11. A 12. C 13. B 14. D 15. A 16. D 17. A 18. C 19. C 20. D 21. A 22. B 23. A 24. C 25. B	Answers 1. D 2. B 3. A 4. D 5. A 6. A 7. B 8. A 9. C 10. C 11. A 12. B 13. C 14. C 15. B 16. B 17. D 18. D 19. A 20. B 21. C 22. C 23. A 24. D 25. D