

Marta Coll and colleagues' 2010 Mediterranean Sea biodiversity census reported approximately 17,000 species, nearly double the number reported in Carlo Bianchi and Carla Morri's 2000 census—a difference only partly attributable to the description of new invertebrate species in the interim. Another factor is that the morphological variability of microorganisms is poorly understood compared to that of vertebrates, invertebrates, plants, and algae, creating uncertainty about how to evaluate microorganisms as species. Researchers' decisions on such matters therefore can be highly consequential. Indeed, the two censuses reported similar counts of vertebrate, plant, and algal species, suggesting that _____

Which choice most logically completes the text?

- A. Coll and colleagues reported a much higher number of species than Bianchi and Morri did largely due to the inclusion of invertebrate species that had not been described at the time of Bianchi and Morri's census.
- B. some differences observed in microorganisms may have been treated as variations within species by Bianchi and Morri but treated as indicative of distinct species by Coll and colleagues.
- C. Bianchi and Morri may have been less sensitive to the degree of morphological variation displayed within a typical species of microorganism than Coll and colleagues were.
- D. the absence of clarity regarding how to differentiate among species of microorganisms may have resulted in Coll and colleagues underestimating the number of microorganism species.

Researchers recently found that disruptions to an enjoyable experience, like a short series of advertisements during a television show, often increase viewers' reported enjoyment. Suspecting that disruptions to an unpleasant experience would have the opposite effect, the researchers had participants listen to construction noise for 30 minutes and anticipated that those whose listening experience was frequently interrupted with short breaks of silence would thus _____

Which choice most logically completes the text?

- A. find the disruptions more irritating as time went on.
- B. rate the listening experience as more negative than those whose listening experience was uninterrupted.
- C. rate the experience of listening to construction noise as lasting for less time than it actually lasted.
- D. perceive the volume of the construction noise as growing softer over time.

In the early nineteenth century, some Euro-American farmers in the northeastern United States used agricultural techniques developed by the Haudenosaunee (Iroquois) people centuries earlier, but it seems that few of those farmers had actually seen Haudenosaunee farms firsthand. Barring the possibility of several farmers of the same era independently developing techniques that the Haudenosaunee people had already invented, these facts most strongly suggest that _____

Which choice most logically completes the text?

- A. those farmers learned the techniques from other people who were more directly influenced by Haudenosaunee practices.
- B. the crops typically cultivated by Euro-American farmers in the northeastern United States were not well suited to Haudenosaunee farming techniques.
- C. Haudenosaunee farming techniques were widely used in regions outside the northeastern United States.
- D. Euro-American farmers only began to recognize the benefits of Haudenosaunee farming techniques late in the nineteenth century.

German theater practitioner Bertolt Brecht (1898–1956) believed that theater should elicit an intellectual rather than an emotional response from audiences, provoking them to consider social and political realities that extend beyond the characters and events depicted onstage. Brecht's influence can be seen in English playwright Caryl Churchill's 1979 play *Cloud 9*: although the play sometimes invites empathetic reactions, it primarily works to engage audiences in an interrogation of patriarchy and colonialism, which it does by placing audiences at a distance, thereby encouraging them to

Which choice most logically completes the text?

- A. focus on the characters' beliefs about social and political issues as revealed by the characters' actions.
- B. reflect on social and political phenomena not directly related to patriarchy and colonialism.
- C. recognize pertinent social and political parallels between Germany during Brecht's time and England at the time when Churchill was writing *Cloud 9*.
- D. be dispassionate as they think critically about the social and political questions raised by the play.

Archaeologists and historians used to believe that the Maya civilization during its Classic period (roughly 250–900) lacked agricultural marketplaces. One reason for this belief was that these scholars misunderstood the ecology of the regions the Maya inhabited. Marketplaces typically emerge because different individuals or groups want to trade resources they control for resources they don't control. Scholars seriously underestimated the ecological diversity of the Maya landscape and thus assumed that _____

Which choice most logically completes the text?

- A. marketplaces likely would not have attracted many traders from outside the regions controlled by the Maya.
- B. farming practices would have been largely the same throughout Maya lands even if the crops people produced varied significantly.
- C. marketplaces would not have enabled Maya people to acquire many products different from those they already produced.
- D. farmers would trade agricultural products only if they had already produced enough to meet their own needs.

Scientists studying Mars long thought the history of its crust was relatively simple. One reason for this is that geologic and climate data collected by a spacecraft showed that the crust was largely composed of basalt, likely as a result of intense volcanic activity that brought about a magma ocean, which then cooled to form the planet's surface. A study led by Valerie Payré focused on additional information—further analysis of data collected by the spacecraft and infrared wavelengths detected from Mars's surface—that revealed the presence of surprisingly high concentrations of silica in certain regions on Mars. Since a planetary surface that formed in a mostly basaltic environment would be unlikely to contain large amounts of silica, Payré concluded that _____

Which choice most logically completes the text?

- A. the information about silica concentrations collected by the spacecraft is likely more reliable than the silica information gleaned from infrared wavelengths detected from Mars's surface.
- B. high silica concentrations on Mars likely formed from a different process than that which formed the crusts of other planets.
- C. having a clearer understanding of the composition of Mars's crust and the processes by which it formed will provide more insight into how Earth's crust formed.
- D. Mars's crust likely formed as a result of other major geological events in addition to the cooling of a magma ocean.

The Hubble Space Telescope (HST) is projected to maintain operation until at least 2030, but it has already revolutionized high-resolution imaging of solar-system bodies in visible and ultraviolet (UV) light wavelengths, notwithstanding that only about 6% of the bodies imaged by the HST are within the solar system. NASA researcher Cindy L. Young and colleagues assert that a new space telescope dedicated exclusively to solar-system observations would permit an extensive survey of minor solar-system bodies and long-term UV observation to discern how solar-system bodies change over time. Young and colleagues' recommendation therefore implies that the HST _____

Which choice most logically completes the text?

- A. will likely continue to be used primarily to observe objects outside the solar system.
- B. will no longer be used to observe solar system objects if the telescope recommended by Young and colleagues is deployed.
- C. can be modified to observe the features of solar system objects that are of interest to Young and colleagues.
- D. lacks the sensors to observe the wavelengths of light needed to discern how solar system bodies change over time.

Geoglyphs are large-scale designs of lines or shapes created in a natural landscape. The Nazca Lines were created in the Nazca Desert in Peru by several Indigenous civilizations over a period of many centuries. Peruvian archaeologist Johnny Isla specializes in these geoglyphs. At a German exhibit about the Nazca Lines, he saw an old photograph of a large geoglyph of a whalelike figure and was surprised that he didn't recognize it. Isla returned to Peru and used a drone to search a wide area, looking for the figure from the air. This approach suggests that Isla thought that if he hadn't already seen it, the whalelike geoglyph _____

Which choice most logically completes the text?

- A. must represent a species of whale that went extinct before there were any people in Peru.
- B. is actually located in Germany, not Peru, and isn't part of the Nazca Lines at all.
- C. is probably in a location Isla hadn't ever come across while on the ground.
- D. was almost certainly created a long time after the other Nazca Lines geoglyphs were created.

Some *Astyanax mexicanus*, a river-dwelling fish found in northeast Mexico, have colonized caves in the region. Although there is little genetic difference between river and cave *A. mexicanus* and all members of the species can emit the same sounds, biologist Carole Hyacinthe and colleagues found that the context and significance of those sounds vary by location—e.g., the click that river-dwelling *A. mexicanus* use to signal aggression is used by cave dwellers when foraging—and the acoustic properties of cave fish sounds show some cave-specific variations as well. Hyacinthe and colleagues note that differences in sonic communication could accumulate to the point of inhibiting interbreeding among fish from different locations, suggesting that _____

Which choice most logically completes the text?

- A. although *A. mexicanus* living in rivers are genetically similar to those living in caves, river fish rely on sonic communication less than cave fish do.
- B. although *A. mexicanus* is a single species at present, it could be in the process of splitting into distinct populations with different characteristics.
- C. although all *A. mexicanus* emit sounds, the fish living in rivers produce some sounds that the fish living in caves do not, and vice versa.
- D. although *A. mexicanus* from different locations can interbreed currently, river fish and cave fish are sufficiently genetically distinct that they can be considered separate species.

Indigenous cultures possess unique knowledge of the medicinal uses of plants. According to a 2021 study, 73 percent of the medicinal uses of plants native to North America are reflected in the vocabulary of a single Indigenous language. However, as more and more Indigenous people exclusively speak a globally dominant language, such as English, their ancestral languages fade from daily use. These facts lend added importance to tribal nations' efforts to preserve their languages. By ensuring the continued use of Cherokee, Ojibwe, and the hundreds of other Indigenous languages in what is now the United States, tribal nations are also _____

Which choice most logically completes the text?

- A. increasing the number of medicinal plants represented in the vocabularies of Indigenous languages.
- B. transmitting terms for medicinal plants from Indigenous languages to globally dominant languages.
- C. preserving knowledge about the medicinal value of plants native to the tribal nations' lands.
- D. ensuring that citizens of tribal nations have physical access to medicinal plants.

Laura Mulvey has theorized that in narrative film, shots issuing from a protagonist's point of view compel viewers to identify with the character. Such identification is heightened by "invisible editing," or editing so inconspicuous that it renders cuts between shots almost unnoticeable. Conversely, Mulvey proposes that conspicuous editing or an absence of point-of-view shots would induce a more critical stance toward a protagonist. Consider, for example, the attic scene in Alfred Hitchcock's *The Birds*, a conspicuously edited sequence of tens of shots, few of which correspond to the protagonist's point of view. According to Mulvey's logic, this scene should affect viewers by _____

Which choice most logically completes the text?

- A. obscuring their awareness of the high degree of artifice involved in constructing the montage.
- B. lessening their identification with the protagonist, if not alienating them from the character altogether.
- C. compelling them to identify with the film's director, whose proxy is the camera, and not with the protagonist.
- D. diverting their attention away from the film's content and toward its stylistic attributes.

Many animals, including humans, must sleep, and sleep is known to have a role in everything from healing injuries to encoding information in long-term memory. But some scientists claim that, from an evolutionary standpoint, deep sleep for hours at a time leaves an animal so vulnerable that the known benefits of sleeping seem insufficient to explain why it became so widespread in the animal kingdom. These scientists therefore imply that _____

Which choice most logically completes the text?

- A. prolonged deep sleep is likely advantageous in ways that have yet to be discovered.
- B. most traits perform functions that are hard to understand from an evolutionary standpoint.
- C. it is more important to understand how widespread prolonged deep sleep is than to understand its function.
- D. many traits that provide significant benefits for an animal also likely pose risks to that animal.

Researchers Suchithra Rajendran and Maximilian Popfinger modeled varying levels of passenger redistribution from short-haul flights (flights of 50 to 210 minutes, from takeoff to landing) to high-speed rail trips. Planes travel faster than trains, but air travel typically requires 3 hours of lead time for security, baggage handling, and boarding that rail travel doesn't, so short-haul routes take similar amounts of time by air and by rail. However, the model suggests that as rail passenger volumes approach current capacity limits, long lead times emerge. Therefore, for rail to remain a viable alternative to short-haul flights, _____

Which choice most logically completes the text?

- A. rail systems should offer fewer long-haul routes and airlines should offer more long-haul routes.
- B. rail systems may need to schedule additional trains for these routes.
- C. security, baggage handling, and boarding procedures used by airlines may need to be implemented for rail systems.
- D. passengers who travel by rail for these routes will need to accept that lead times will be similar to those for air travel.

Henry Ossawa Tanner's 1893 painting *The Banjo Lesson*, which depicts an elderly man teaching a boy to play the banjo, is regarded as a landmark in the history of works by Black artists in the United States. Scholars should be cautious when ascribing political or ideological values to the painting, however: beliefs and assumptions that are commonly held now may have been unfamiliar to Tanner and his contemporaries, and vice versa. Scholars who forget this fact when discussing *The Banjo Lesson* therefore _____

Which choice most logically completes the text?

- A. risk judging Tanner's painting by standards that may not be historically appropriate.
- B. tend to conflate Tanner's political views with those of his contemporaries.
- C. forgo analyzing Tanner's painting in favor of analyzing his political activity.
- D. wrongly assume that Tanner's painting was intended as a critique of his fellow artists.

A heliograph is a semaphore device used for sending optical communications—usually in the form of Morse code—by reflecting flashes of sunlight off a mirror. Heliographs were used for rapid communication across expansive distances for military, surveying, and forestry purposes during the late nineteenth and early twentieth centuries, but they were largely effective only during the daytime, and the range of the device depended on factors such as the opacity of the air and line of sight. Therefore, heliographs were eventually replaced by technology that _____

Which choice most logically completes the text?

- A. worked on similar principles but was easier to produce and maintain.
- B. was not so constrained by environmental circumstances.
- C. could be used for more than military, surveying, or forestry purposes.
- D. enabled communication that didn't require knowledge of Morse code.

Aerogels are highly porous foams consisting mainly of tiny air pockets within a solidified gel. These lightweight materials are often applied to spacecraft and other equipment required to withstand extreme conditions, as they provide excellent insulation despite typically being brittle and eventually fracturing due to degradation from repeated exposure to high heat. Now, Xiangfeng Duan of the University of California, Los Angeles, and colleagues have developed an aerogel with uniquely flexible properties. Unlike earlier aerogels, Duan's team's material contracts rather than expands when heated and fully recovers after compressing to just 5% of its original volume, suggesting that _____

Which choice most logically completes the text?

- A. the aerogel's remarkable flexibility results from its higher proportion of air pockets to solidified gel as compared to other aerogels.
- B. the aerogel's overall strength is greater than that of other insulators but its ability to withstand exposure to intense heat is lower.
- C. the aerogel will be more effective as an insulator for uses that involve gradual temperature shifts than for those that involve rapid heat increases.
- D. the aerogel will be less prone to the structural weakness that ultimately causes most other aerogels to break down with use.

Tides can deposit large quantities of dead vegetation within a salt marsh, smothering healthy plants and leaving a salt panne—a depression devoid of plants that tends to trap standing water—in the marsh’s interior. Ecologist Kathryn Beheshti and colleagues found that burrowing crabs living within these pannes improve drainage by loosening the soil, leading the pannes to shrink as marsh plants move back in. At salt marsh edges, however, crab-induced soil loosening can promote marsh loss by accelerating erosion, suggesting that the burrowing action of crabs _____

Which choice most logically completes the text?

- A. can be beneficial to marshes with small pannes but can be harmful to marshes with large pannes.
- B. may promote increases in marsh plants or decreases in marsh plants, depending on the crabs’ location.
- C. tends to be more heavily concentrated in areas of marsh interiors with standing water than at marsh edges.
- D. varies in intensity depending on the size of the panne relative to the size of the surrounding marsh.

“Gestures” in painting are typically thought of as bold, expressive brushstrokes. In the 1970s, American painter Jack Whitten built a 12-foot (3.7-meter) tool he named the “developer” to apply paint to an entire canvas in one motion, resulting in his series of “slab” paintings from that decade. Whitten described this process as making an entire painting in “one gesture,” signaling a clear departure from the prevalence of gestures in his work from the 1960s. Some art historians claim this shift represents “removing gesture” from the process. Therefore, regardless of whether using the developer constitutes a gesture, both Whitten and these art historians likely agree that _____

Which choice most logically completes the text?

- A. any tool that a painter uses to create an artwork is capable of creating gestures.
- B. Whitten’s work from the 1960s exhibits many more gestures than his work from the 1970s does.
- C. Whitten became less interested in exploring the role of gesture in his work as his career progressed.
- D. Whitten’s work from the 1960s is much more realistic than his work from the 1970s is.

During the Bourbon Restoration in France (1814–1830), the right to vote required in part that a person paid at least 300 francs in direct taxes to the government. The four most common taxes (the *quatre vieilles*) were levied on real estate (both land and buildings); the doors and windows in taxpayer homes; the rental values of homes; and the businesses of artisans and merchants. (Foreign investments were either exempt from taxation or taxed lightly.) Although relatively few people paid the tax on real estate, it was the main means of voter qualification and accounted for over two-thirds of government receipts during this period, suggesting that during the Bourbon Restoration _____

Which choice most logically completes the text?

- A. those people who had the right to vote most likely had substantial holdings of French real estate.
- B. the voting habits of French artisans and merchants were effective in reducing tax burdens on businesses.
- C. the number of doors and windows in French residences was kept to a minimum but increased after 1830.
- D. French people with significant foreign investments were unlikely to have the right to vote.

Mosses can struggle in harsh desert conditions because these plants require enough sunlight for photosynthesis but not so much that they risk drying out. Researchers Jenna Ekwealor and Kirsten M. Fisher found several species of *Syntrichia caninervis*, a type of desert moss, growing under quartz crystals in California's Mojave Desert. To evaluate whether these semitransparent rocks benefited the moss, the researchers compared the shoot tissue, a measure of plant growth, of *S. caninervis* when growing on the soil surface versus when the moss was growing under the quartz rocks. They found that the shoot tissue was 62% longer for moss growing under the quartz as compared to moss on the soil surface, suggesting that

Which choice most logically completes the text?

- A. *S. caninervis* is one of the few types of moss that can survive under semitransparent rocks.
- B. quartz crystals do not transmit the necessary sunlight for photosynthesis in *S. caninervis*.
- C. *S. caninervis* growing under quartz crystals experience lower light intensity and are thus able to retain more moisture.
- D. quartz crystals are capable of supporting *S. caninervis* growth if the crystals are not too thin.

To better understand the burrowing habits of *Alpheus bellulus* (the tiger pistol shrimp), some studies have used resin casting to obtain precise measurements of the shrimps' burrows. Resin casting involves completely filling an empty burrow with a liquid plastic that hardens to create a three-dimensional model; however, recovering the model inevitably requires destroying the burrow. In their 2022 study, Miyu Umehara and colleagues discovered that an x-ray computed tomography (CT) scanner can accurately record a burrow's measurements both at a moment in time and throughout the entire burrow-building process, something that's impossible with resin casting because _____

Which choice most logically completes the text?

- A. it can only be used on burrows below a certain size.
- B. it does not allow for multiple castings of the same burrow over time.
- C. the casting process takes more time than *A. bellulus* takes to construct a burrow.
- D. the process of recovering the model distorts the resin's shape.