

# SAT Reading

WORKBOOK

## Common Second Meanings

Affect (v.) – to take on, assume; affected (adj.) – behaving in an artificial/pretentious way

Afford – to grant (e.g., to afford an opportunity)

Allow – to enable, permit

Appreciate – to take into account, recognize the merits of, OR to increase in value

Appropriate (app-row-pree-ATE) – to take from, steal

Arrest – to stop (not just put handcuffs on a criminal)

Assume – to take on responsibility for, acquire (e.g., to assume a new position)

Basic – fundamental, essential

Bent – liking or preference for

Capacity – ability

Chance (v.) – to attempt

Check – to control (e.g., the vaccine checked the spread of the disease)

Clear – obvious, evident

Common – widespread

Compromise (v.) – to endanger or make vulnerable (e.g., to compromise one's beliefs)

Constitution – build (e.g., a football player has a solid constitution)

Conviction – strong belief. Noun form of *convinced*.

Currency – acceptance, approval (of an idea)

Demonstrate – to establish (e.g., to demonstrate the validity of a hypothesis)

Economy – thrift (e.g., a writer who has an economical style is one who uses few words)

Element – component, aspect

Elevated – lofty, high-minded, idealistic

Establish – to prove, validate (e.g., to establish the accuracy of a theory)

Execute – to carry out (e.g., to execute an order)

Exercise – to put into use, carry out a function

Exploit – to make use of, take advantage of (does not carry a negative connotation)

Facility – the ability to do something easily (e.g., a facility for learning languages)

Faculty – ability or aptitude

Fancy (v.) – to take a liking to

Fine – (1) narrow, thin (e.g., fine lines); (2) delicate, elegant; (3) keen, highly attuned

Foil – to put a stop to (e.g., to foil a robbery)

Fundamental – basic, essential

Grave/Gravity – serious(ness)

Kicks – amusement (e.g., just for kicks)

Nature – character, personality

Observe – to follow (e.g., to observe a law)

Plastic/plasticity – able to be changed or shaped (e.g., brain plasticity)

Poor – inferior, substandard, ill

Provoke – to elicit (e.g., to provoke a reaction)

Qualify – to provide more information or detail about

Range – scope

Raw – unrefined, unfiltered

Realize – to achieve (a goal)

Reconcile – to bring together opposing or contradictory ideas

Relate/Relay - to pass on information, give an account of (a story)

Reservations – doubts, misgivings

Reserve – to hold off on (e.g., to reserve judgment)

Scale – level (e.g., the experiment was repeated on a larger scale)

Scrap (v.) – to eliminate

Sheer – utter, complete

Sound – firm, stable, reliable, valid (e.g., a sound argument)

Spare, Severe – plain, unadorned

Static – unchanging

Store (n.) – reserve, stock (e.g., to keep a store of food for emergencies)

Strength – significance

Sustain (v.) – to withstand

Temper – to moderate, make less harsh

Train – to fixate on (e.g., to train one's eyes on something)

Treat – to alter

Uniform (adj.) – constant, unvarying

Unqualified – absolute

Upset (v.) – to interfere with an expected outcome

Urge – to argue in favor of, advocate

Want (n.) – lack

Weight – seriousness, importance

Yield – to reveal (e.g., an experiment yields results)

## **Additional Words to Know**

Arbitrary – done or decided randomly, without clear reason

Bolster – to provide support for (an argument)

Comprehensive – thorough, complete

Condone – to disregard or pardon an illegal or objectionable act

Deter – to discourage

Disparity – difference, gap

Diverge – to separate from

Doctrine – principle or set of teachings

Empirical – derived from experiment or observation

Endeavor – attempt

Esteem (v.) – to hold in high regard

Feasible – doable

Grievance – a wrong, grounds for complaint

Hypothesis – educated guess

Idealistic – cherishing noble or high-minded principles

Indifferent – not caring, utterly detached

Inevitable – unavoidable

Innate – inborn

Innovation – new invention or discovery

Legislation – laws

Lofty – high-minded, exalted

Moral – concerned with the rules of right and wrong

Paradox – apparent contradiction

Partisan – strong adherent to a party or idea

Phenomenon – occurrence

Pragmatic, Prudent – practical

Scrutinize – to examine closely

Skeptical – questioning, doubtful

Stagnation – failure to progress or grow

Stipulate – to specify a requirement

Subordinate – lower-ranking

Substantiate – to prove; unsubstantiated – unproven

Synthesize – to bring together, integrate

Undermine – to weaken, attack indirectly

Underscore – to emphasize

## Vocabulary in Context Exercises

1. Math poses difficulties. There's little room for eyewitness testimony, seasoned judgment, a skeptical eye or transcendental rhetoric.

2. Around the middle of the 20th century, science dispensed with the fantasy that we could easily colonize the other planets in our solar system. Science fiction writers absorbed the new reality: soon, moon and 5 asteroid settings replaced Mars and Venus.

3. Conservationists have historically been at odds with the people who inhabit wildernesses. During the last half of the 20th century, millions of indigenous people were ousted from their homelands to establish 5 nature sanctuaries free of humans. Most succumbed to malnutrition, disease and exploitation. Such outcomes—coupled with the realization that indigenous groups usually help to stabilize ecosystems by, for instance, keeping fire at bay—have convinced major conservation 10 groups to take local human concerns into account. The World Wildlife Fund (WWF) now describes indigenous peoples as “natural allies,” and the Nature Conservancy pledges to seek their “free, informed and prior” consent to projects impacting their territories.

1

As used in line 2, “seasoned” most nearly means

- A) determined.
- B) tasteful.
- C) experienced.
- D) objective.

1

As used in line 2 “dispensed with” most nearly means

- A) distributed.
- B) disposed of.
- C) identified with.
- D) renewed.

1

As used in line 5, “free” most nearly means

- A) liberated.
- B) uncompensated.
- C) devoid.
- D) whole.

2

As used in line 7, “coupled” most nearly means

- A) cooperated.
- B) associated.
- C) related.
- D) combined.

3

As used in line 10, “account” most nearly means

- A) contact.
- B) consideration.
- C) favor.
- D) prominence.

4. Perhaps the most classic definition of a species is a group of organisms that can breed with each other to produce fertile offspring, an idea originally set forth in 1942 by evolutionary biologist Ernst Mayr. While 5 elegant in its simplicity, this concept has since come under fire by biologists, who argue that it didn't apply to many organisms, such as single-celled ones that reproduce asexually, or those that have been shown to breed with other distinct organisms to create hybrids.

10 Alternatives quickly arose. Some biologists championed an ecological definition that assigned species according to the environmental niches they fill (this animal recycles soil nutrients, this predator keeps insects in check). Others asserted that a species was a 15 set of organisms with physical characteristics that were distinct from others (the peacock's fanned tail, the beaks of Darwin's finches).

The discovery of DNA's double helix prompted the creation of yet another definition, one in which scientists 20 could look for minute genetic differences and draw even finer lines denoting species. Based on a 1980 book by biologists Niles Eldredge and Joel Cracraft, under the definition of a phylogenetic species, animal species now can differ by just 2 percent of their DNA to be 25 considered separate.

5. Citrus greening, the plague that could wipe out Florida's \$9 billion orange industry, begins with the touch of a jumpy brown bug on a sun-kissed leaf. From there, the bacterial disease incubates in the 5 tree's roots, then moves back up the trunk in full force, causing nutrient flows to seize up. Leaves turn yellow, and the oranges, deprived of sugars from the leaves, remain green, sour, and hard. Many fall before harvest, brown necrotic flesh ringing failed stems.

10 For the past decade, Florida's oranges have been literally starving. Since it first appeared in 2005, citrus greening, also known by its Chinese name, huanglongbing, has swept across Florida's groves like a flood. With no hills to block it, the Asian citrus 15 psyllid—the invasive aphid relative that carries the disease—has infected nearly every orchard in the state. By one estimate, 80 percent of Florida's citrus trees are infected and declining.

The disease has spread beyond Florida to nearly 20 every orange-growing region in the United States. Despite many generations of breeding by humanity, no citrus plant resists greening; it afflicts lemons,

As used in line 11, "championed" most nearly means

- A) advocated.
- B) denied.
- C) counseled.
- D) disrupted.

As used in line 18, "prompted" most nearly means

- A) rejected.
- B) elaborated.
- C) spurred.
- D) defended.

As used in line 21, "finer" most nearly means

- A) narrower.
- B) keener.
- C) milder.
- D) daintier.

grapefruits, and other citrus species as well. Once a tree is infected, it will die. Yet in a few select

25 Floridian orchards, there are now trees that, thanks to innovative technology, can fight the greening tide.

As it is used in line 9, "ringing" most nearly means

- A) nourishing.
- B) implanting.
- C) growing.
- D) surrounding.

As it is used in line 24, "select" most nearly means

- A) exclusive.
- B) preferred.
- C) particular.
- D) conventional.

**6. Chimps do it, birds do it, even you and I do it.**

Once you see someone yawn, you are compelled to do the same. Now it seems that wolves can be added to the list of animals known to spread yawns like a contagion.

Among humans, even thinking about yawning can trigger the reflex, leading some to suspect that catching a yawn is linked to our ability to empathize with other humans. For instance, contagious yawning activates the same parts of the brain that govern empathy and social know-how. And some studies have shown that humans with more fine-tuned social skills are more likely to catch a yawn.

**7. The following passage is adapted from Daniel Webster's speech to the Senate in support of the Compromise of 1850, the congressional effort to resolve the issues propelling the United States toward a civil war.**

I wish to speak to-day, not as a Massachusetts man, nor as a Northern man, but as an American, and a member of the Senate of the United States. It is fortunate that there is a Senate of the United States; a body not yet moved from its propriety, not lost to a just sense of its own dignity and its own high responsibilities, and a body to which the country looks, with confidence, for wise, moderate, patriotic, and healing counsels. It is not to be denied that we live in the midst of strong agitations, and are surrounded by very considerable dangers to our institutions and government. The imprisoned winds are let loose. The East, the North, and the stormy South combine to throw the whole sea into commotion, to toss its billows to the skies, and disclose its profoundest depths. I do not affect to regard myself, Mr. President, as holding, or as fit to hold, the helm in this combat with the political elements; but I have a duty to perform, and I mean to perform it with fidelity, not without a sense of existing dangers, but not without hope. I have a part to act, not for my own security or safety, for I am looking out for no fragment upon which to float away from the wreck, if wreck there must be, but for the good of the whole, and the preservation of all; and there is that which will keep me to my duty during this struggle, whether the sun and the stars shall appear, or shall not appear for many days. I speak to-day for the preservation of the Union.

**1** As used in line 10, "govern" most nearly means

- A) elect.
- B) control.
- C) charge.
- D) require.

**1** As used in line 16, "fit" most nearly means

- A) coordinated.
- B) adjusted.
- C) healthy.
- D) suited.

**2** As used in line 20, "part" most nearly means

- A) aspect.
- B) role.
- C) section.
- D) sliver.

8. To understand what the new software—that is, analytics—can do that's different from more familiar software like spreadsheets, word processing, and graphics, consider the lowly photograph. Here the
- 5 relevant facts aren't how many bytes constitute a digital photograph, or a billion of them. That's about as instructive as counting the silver halide molecules used to form a single old-fashioned print photo. The important feature of a digital image's bytes is that, unlike
- 10 crystalline molecules, they are uniquely easy to store, transport, and manipulate with software. In the first era of digital images, people were fascinated by the convenience and malleability (think PhotoShop) of capturing, storing, and sharing pictures. Now, instead of
- 15 using software to manage photos, we can mine features of the bytes that make up the digital image. Facebook can, without privacy invasion, track where and when, for example, vacationing is trending, since digital images reveal at least that much. But more importantly, those
- 20 data can be cross-correlated, even in real time, with seemingly unrelated data such as local weather, interest rates, crime figures, and so on. Such correlations associated with just one photograph aren't revealing. But imagine looking at billions of photos over weeks,
- 25 months, years, then correlating them with dozens of directly related data sets (vacation bookings, air traffic), tangential information (weather, interest rates, unemployment), or orthogonal information (social or political trends). With essentially free super-computing,
- 30 we can mine and usefully associate massive, formerly unrelated data sets and unveil all manner of economic, cultural, and social realities.
- For science fiction aficionados, Isaac Asimov anticipated the idea of using massive data sets to predict
- 35 human behavior, coining it "psychohistory" in his 1951 Foundation trilogy. The bigger the data set, Asimov said then, the more predictable the future. With big-data analytics, one can finally see the forest, instead of just the capillaries in the tree leaves. Or to put it in more
- 40 accurate terms, one can see beyond the apparently random motion of a few thousand molecules of air inside a balloon; one can see the balloon itself, and beyond that, that it is inflating, that it is yellow, and that it is part of a bunch of balloons en route to a birthday party. The
- 45 data/software world has, until now, been largely about looking at the molecules inside one balloon.

1

- As in line 15, "mine" most nearly means
- A) exploit.
  - B) contain.
  - C) respond.
  - D) describe.

2

- As used in line 31, "unveil" most nearly means
- A) reveal.
  - B) analyze.
  - C) alter.
  - D) uphold.

3

- As used in line 34, "anticipated" most nearly means
- A) expected.
  - B) accumulated.
  - C) foresaw.
  - D) explained.

9. This passage is adapted from Sharon Tregaskis, "What Bees Tell Us About Global Climate Change," © 2010 by Johns Hopkins Magazine.

Standing in the apiary on the grounds of the U.S. Department of Agriculture's Bee Research Laboratory in Beltsville, Maryland, Wayne Esaias digs through the canvas shoulder bag leaning against his leg in search of the cable he uses to download data. It's dusk as he runs the cord from his laptop—precariously perched on the beam of a cast-iron platform scale—to a small, battery-operated data logger attached to the spring inside the scale's steel column. In the 1800s, a scale like this would have weighed sacks of grain or crates of apples, peaches, and melons. Since arriving at the USDA's bee lab in January 2007, this scale has been loaded with a single item: a colony of *Apis mellifera*, the fuzzy, black-and-yellow honey bee. An attached, 12-bit recorder captures the hive's weight to within a 10th of a pound, along with a daily register of relative ambient humidity and temperature.

On this late January afternoon, during a comparatively balmy respite between the blizzards that dumped several feet of snow on the Middle Atlantic states, the bees, their honey, and the wooden boxes in which they live weigh 94.5 pounds. In mid-July, as last year's unusually long nectar flow finally ebbed, the whole contraption topped out at 275 pounds, including nearly 150 pounds of honey. "Right now, the colony is in a cluster about the size of a soccer ball," says Esaias, who's kept bees for nearly two decades and knows without lifting the lid what's going on inside this hive. "The center of the cluster is where the queen is, and they're keeping her at 93 degrees—the rest are just hanging there, tensing their flight muscles to generate heat." Provided that they have enough calories to fuel their winter workout, a healthy colony can survive as far north as Anchorage, Alaska. "They slowly eat their way up through the winter," he says. "It's a race: Will they eat all their honey before the nectar flows, or not?" To make sure their charges win that race, apiarists have long relied on scale hives for vital management clues. By tracking daily weight variations, a beekeeper can discern when the colony needs a nutritional boost to carry it through lean times, whether to add extra combs for honey storage and even detect incursions by marauding robber bees—all without disturbing the colony. A graph of the hive's weight—which can

increase by as much as 35 pounds a day in some parts of the United States during peak nectar flow—reveals the date on which the bees' foraging was most productive and provides a direct record of successful pollination. "Around here, the bees make their living in the month of May," says Esaias, noting that his bees often achieve daily spikes of 25 pounds, the maximum in Maryland. "There's almost no nectar coming in for the rest of the year." A scientist by training and career oceanographer at NASA, Esaias established the Mink Hollow Apiary in his Highland, Maryland, backyard in 1992 with a trio of hand-made hives and an antique platform scale much like the one at the Beltsville bee lab. Ever since, he's maintained a meticulous record of the bees' daily weight, as well as weather patterns and such details as his efforts to keep them healthy. In late 2006, honey bees nationwide began disappearing in an ongoing syndrome dubbed colony collapse disorder (CCD). Entire hives went empty as bees inexplicably abandoned their young and their honey. Commercial beekeepers reported losses up to 90 percent, and the large-scale farmers who rely on honey bees to ensure rich harvests of almonds, apples, and sunflowers became very, very nervous. Looking for clues, Esaias turned to his own records. While the resulting graphs threw no light on the cause of CCD, a staggering trend emerged: In the span of just 15 seasons, the date on which his Mink Hollow bees brought home the most nectar had shifted by two weeks—from late May to the middle of the month. "I was shocked when I plotted this up," he says. "It was right under my nose, going on the whole time." The epiphany would lead Esaias to launch a series of research collaborations, featuring honey bees and other pollinators, to investigate the relationships among plants, pollinators, and weather patterns. Already, the work has begun to reveal insights into the often unintended consequences of human interventions in natural and agricultural ecosystems, and exposed significant gaps in how we understand the effect climate change will have on everything from food production to terrestrial ecology.

1

As used in line 41, “lean” most nearly means

- A) tilted.
- B) scarce.
- C) compact.
- D) sunken.

2

As used in line 42, “incursions” most nearly means

- A) intentions.
- B) introductions.
- C) intrusions.
- D) initiatives.

3

As used in lines 49-50, “make their living” most  
nearly means

- A) grow heavier.
- B) accumulate funds.
- C) behave aggressively.
- D) are most productive.

4

As used in line 68, “rich” most nearly means

- A) plentiful.
- B) costly.
- C) heavy.
- D) fragrant.

10. The following passage is adapted from the novel *Summer* by Edith Wharton, initially published in 1917.

The hours of the Hatchard Memorial librarian were from three to five; and Charity Royall's sense of duty usually kept her at her desk until nearly half-past four. But she had never perceived that any practical advantage thereby accrued either to North Dormer or to herself; and she had no scruple in decreeing, when it suited her, that the library should close an hour earlier. A few minutes after Mr. Harney's departure she formed this decision, put away her lace, fastened the shutters, 5 and turned the key in the door of the temple of knowledge. The street upon which she emerged was still empty; and after glancing up and down it she began to walk toward her house. But instead of entering she passed on, turned into a field-path and mounted to a 10 pasture on the hillside.

She let down the bars of the gate, followed a trail along the crumbling wall of the pasture, and walked on till she reached a knoll where a clump of larches shook out their fresh tassels to the wind. There she lay down 15 on the slope, tossed off her hat and hid her face in the grass. She was blind and insensible to many things, and dimly knew it; but to all that was light and air, perfume and color, every drop of blood in her responded. She loved the roughness of the dry mountain grass under 20 her palms, the smell of the thyme into which she crushed her face, the fingering of the wind in her hair and through her cotton blouse, and the creak of the larches as they swayed to it.

She often climbed up the hill and lay there alone for 25 the mere pleasure of feeling the wind and of rubbing her cheeks in the grass. Generally at such times she did not think of anything, but lay immersed in an inarticulate well-being. Today the sense of well-being was intensified by her joy at escaping from the library. She 30 liked well enough to have a friend drop in and talk to her when she was on duty, but she hated to be bothered about books. How could she remember where they were, when they were so seldom asked for? Orma Fry occasionally took out a novel, and her brother Ben was 35 fond of what he called "jography," and of books relating to trade and bookkeeping; but no one else asked for anything except, at intervals, "Uncle Tom's Cabin," or "Opening of a Chestnut Burr," or Longfellow. She had these under her hand, and could have found them 40 in the dark; but unexpected demands came so rarely 45 that they exasperated her like an injustice....

She had liked the young man's looks, and his shortsighted eyes, and his odd way of speaking, that was abrupt yet soft, just as his hands were sun-burnt and sinewy, yet

50 with smooth nails like a woman's. His hair was sunburnt-looking too, or rather the colour of bracken after frost; eyes grey, with the appealing look of the shortsighted, his smile shy yet confident, as if he knew lots of things she had never dreamed of, and yet 55 wouldn't for the world have had her feel his superiority. But she did feel it, and liked the feeling; for it was new to her. Poor and ignorant as she was, and knew herself to be—humblest of the humble even in North Dormer, where to come from the Mountain was the worst 60 disgrace—yet in her narrow world she had always ruled. It was partly, of course, owing to the fact that lawyer Royall was "the biggest man in North Dormer"; so much too big for it, in fact, that outsiders, who didn't know, always wondered how it held him. In spite of 65 everything—and in spite even of Miss Hatchard—lawyer Royall ruled in North Dormer; and Charity ruled in lawyer Royall's house. She had never put it to herself in those terms; but she knew her power. Confusedly, the young man in the library had made her feel for the first 70 time what might be the sweetness of dependence. She sat up and looked down on the house where she held sway.

It stood just below her, cheerless and untended. Behind the house a bit of uneven ground with clothes-lines strung across it stretched up to a dry wall, and beyond the wall a patch of corn and a few rows of potatoes strayed vaguely into the adjoining wilderness of rock and fern.

1

As used in line 21 "blind" most nearly means

- A) weak.
- B) unaware.
- C) modest.
- D) careless.

2

As used in line 72, "sway" most nearly means

- A) motion.
- B) influence.
- C) relief.
- D) interest.

## Pronoun and Compression Noun Exercises

Directions: underline the word, phrase, or lines in the passage to which the compression noun in each sentence refers.

1. What drives traffic on most “news” websites is not journalism but a combination of snark and celebrity clickbait. Much of it is churned out in soul-destroying content factories manned by inexperienced—and therefore inexpensive—young people without the time or incentive to dig deeply into anything. This deficit is particularly acute where it matters most: in the kind of expensive, far-flung reporting that is either dangerous to the lives of those doing the work or harmful to the bottom lines of the publications paying for it. The idea that readers will pay the actual cost of meaningful journalism has never been sustainable in the United States and has brought down nearly every entity that has tried to depend on it.
  
2. While humpback dolphins look quite similar to other dolphins, their genetics tells a different story. Researchers collected 235 tissue samples and 180 skulls throughout the animals’ distribution, representing the biggest dataset assembled to date for the animals. The team analyzed mitochondrial and nuclear DNA from the tissue, which revealed significant variations. Although the line between species, sub-species and populations is a blurry one, in this case, the researchers are confident that the humpback dolphin is distinct enough to warrant the “species” title. The mitochondrial DNA turned up genetic signatures distinct enough to signal a separate species, and likewise, differences in the dolphins’ skulls supported this divergence. Although the nuclear DNA provided a slightly more confounding picture, it still clearly showed differences between the four species.
  
3. Soon after the Big Bang, there were tiny ripples: quantum fluctuations in the density of the seething ball of hot plasma. Billions of years later, those seeds have grown into galaxy clusters — sprawling groups of hundreds or thousands of galaxies bound together by gravity. But there seems to be a mismatch. Results released last year suggest that as much as 40% of galaxy-cluster mass is missing when compared with the amount of clustering predicted by the ripples. The findings have led theorists to propose physics beyond the standard model of cosmology to make up the difference.

1. [REDACTED]

What does “this deficit” (line 6) refer to?

2. [REDACTED]

What does “it” (line 14) refer to?

1. [REDACTED]

What does “this divergence” (line 14) refer to?

2. [REDACTED]

What does “it” (line 16) refer to?

1. [REDACTED]

What do “those seeds” (line 3) refer to?

2. [REDACTED]

What do “the findings” (line 10) refer to?

4. Conservationists have historically been at odds with the people who inhabit wildernesses. During the last half of the 20th century, millions of indigenous people were ousted from their homelands to establish nature sanctuaries free of humans. Most succumbed to 5 malnutrition, disease and exploitation. Such outcomes—coupled with the realization that indigenous groups usually help to stabilize ecosystems by, for instance, keeping fire at bay—have convinced major conservation groups to take local human concerns into account. The 10 World Wildlife Fund (WWF) now describes indigenous peoples as “natural allies,” and the Nature Conservancy pledges to seek their “free, informed and prior” consent to projects impacting their territories.

5. The starlings show up over Rome around dusk, heading for their roosts after a day of feeding in the countryside. In flocks of several hundred to several thousand, they form sinuous streams, whirling 5 cylinders, cones or ribbons spread across the sky like giant flags. Wheeling and dipping together, they reminded Andrea Cavagna, a physicist at the National Research Council of Italy, of atoms falling into place in a superfluid state of matter called a Bose-Einstein 10 condensate. Out of curiosity, Cavagna deployed a camera to record the flights. As a particle physicist, he says, “it was refreshing to work with something you can actually see.” But keeping track of a thousand birds turned out to be much more complicated than a billion 15 billion atoms.

Cavagna was hardly the first scientist to be intrigued by these acrobatics—known, in a rare instance of technical language coinciding with poetry, as “murmurations.” Other animals that travel in groups— 20 schooling fish, most obviously—show the same uncanny ability to move in apparent unison away from a predator or toward a food source.

1

What does “such outcomes” (line 5) refer to?

1

What does “they” (line 4) refer to?

2

What do “these acrobatics” (line 17) refer to?

6. I wish to speak to-day, not as a Massachusetts man, nor as a Northern man, but as an American, and a member of the Senate of the United States. It is fortunate that there is a Senate of the United States; 5 a body not yet moved from its propriety, not lost to a just sense of its own dignity and its own high responsibilities, and a body to which the country looks, with confidence, for wise, moderate, patriotic, and healing counsels. It is not to be denied that we live in the midst of strong 10 agitations, and are surrounded by very considerable dangers to our institutions and government. The imprisoned winds are let loose. The East, the North, and the stormy South combine to throw the whole sea into commotion, to toss its billows to the skies, and 15 disclose its profoundest depths. I do not affect to regard myself, Mr. President, as holding, or as fit to hold, the helm in this combat with the political elements; but I have a duty to perform, and I mean to perform it with fidelity, not without a sense of existing dangers, but not 20 without hope. I have a part to act, not for my own security or safety, for I am looking out for no fragment upon which to float away from the wreck, if wreck there must be, but for the good of the whole, and the preservation of all; and there is that which will keep me 25 to my duty during this struggle, whether the sun and the stars shall appear, or shall not appear for many days. I speak to-day for the preservation of the Union.

7. Chimps do it, birds do it, even you and I do it. Once you see someone yawn, you are compelled to do the same. Now it seems that wolves can be added to the list of animals known to spread yawns like a 5 contagion. Among humans, even thinking about yawning can trigger the reflex, leading some to suspect that catching a yawn is linked to our ability to empathize with other humans. For instance, contagious yawning activates the 10 same parts of the brain that govern empathy and social know-how. And some studies have shown that humans with more fine-tuned social skills are more likely to catch a yawn. Similarly, chimpanzees, baboons and bonobos 15 often yawn when they see other members of their species yawning. Chimps (*Pan troglodytes*) can catch yawns from humans, even virtual ones. At least in primates, contagious yawning seems to require an emotional connection and may function as a demonstration of 20 empathy. Beyond primates, though, the trends are less clear-cut. One study found evidence of contagious yawning in birds but didn't connect it to empathy.

1. What does "a body" (lines 5 and 7) refer to?

2. What does "its" (lines 14 and 15) refer to?

3. What does "it" (line 18) refer to?

1. What do "the trends" (line 20) refer to?

2. What does "it" (line 22) refer to?

8. It was one hundred and forty-four years ago that members of the Democratic Party first met in convention to select a Presidential candidate. A lot of years passed since 1832, and during that time it would  
5 have been most unusual for any national political party to ask a Barbara Jordan to deliver a keynote address. But tonight, here I am. And I feel that notwithstanding the past that my presence here is one additional bit of evidence that the American Dream need not forever be  
10 deferred.

Now that I have this grand distinction, what in the world am I supposed to say? I could list the problems which cause people to feel cynical, angry, frustrated; problems which include lack of integrity in government;  
15 the feeling that the individual no longer counts; feeling that the grand American experiment is failing or has failed. I could recite these problems, and then I could sit down and offer no solutions. But I don't choose to do that either. The citizens of America expect more.

9. The most ancient of all societies, and the only one that is natural, is the family: and even so the children remain attached to the father only so long as they need him for their preservation. As soon as this  
5 need ceases, the natural bond is dissolved. The children, released from the obedience they owed to the father, and the father, released from the care he owed his children, return equally to independence. If they remain united, they continue so no longer naturally, but voluntarily; and  
10 the family itself is then maintained only by convention.

This common liberty results from the nature of man. His first law is to provide for his own preservation, his first cares are those which he owes to himself; and, as soon as he reaches years of discretion, he is the sole  
15 judge of the proper means of preserving himself, and consequently becomes his own master.

The family then may be called the first model of political societies: the ruler corresponds to the father, and the people to the children; and all, being born free  
20 and equal, alienate their liberty only for their own advantage. The whole difference is that, in the family, the love of the father for his children repays him for the care he takes of them, while, in the State, the pleasure of commanding takes the place of the love which the chief  
25 cannot have for the peoples under him.

1

What does "this grand distinction" (line 11) refer to?

1

What does "they" (line 9) refer to?

2

What does "this common liberty" (line 11) refer to?

10. The sharing economy is a little like online shopping, which started in America 15 years ago. At first, people were worried about security. But having made a successful purchase from, say, Amazon, they 5 felt safe buying elsewhere. Similarly, using Airbnb or a car-hire service for the first time encourages people to try other offerings. Next, consider eBay. Having started out as a peer-to-peer marketplace, it is now dominated by professional “power sellers” (many of whom started 10 out as ordinary eBay users). The same may happen with the sharing economy, which also provides new opportunities for enterprise. Some people have bought cars solely to rent them out, for example. Incumbents are getting involved too. Avis, a car-hire firm, has a share 15 in a sharing rival. So do GM and Daimler, two carmakers. In the future, companies may develop hybrid models, listing excess capacity (whether vehicles, equipment or office space) on peer-to-peer rental sites. In the past, new ways of doing things online have not displaced the 20 old ways entirely. But they have often changed them. Just as internet shopping forced Walmart and Tesco to adapt, so online sharing will shake up transport, tourism, equipment-hire and more.

The main worry is regulatory uncertainty. Will 25 room-4-renters be subject to hotel taxes, for example? In Amsterdam officials are using Airbnb listings to track down unlicensed hotels. In some American cities, peer-to-peer taxi services have been banned after lobbying by traditional taxi firms. The danger is that 30 although some rules need to be updated to protect consumers from harm, incumbents will try to destroy competition. People who rent out rooms should pay tax, of course, but they should not be regulated like a Ritz-Carlton hotel. The lighter rules that typically govern 35 bed-and-breakfasts are more than adequate. The sharing economy is the latest example of the internet’s value to consumers. This emerging model is now big and disruptive enough for regulators and companies to have woken up to it. That is a sign of its immense potential. It 40 is time to start caring about sharing.

1. [REDACTED]

What does “it” (line 8) refer to?

2. [REDACTED]

What do “they” and “them” (line 20) refer to?

3. [REDACTED]

What does “this emerging model” (line 37) refer to?

11. The following passage is adapted from "Scientists Discover Salty Aquifer, Previously Unknown Microbial Habitat Under Antarctica," © 2015 by Dartmouth College.

Using an airborne imaging system for the first time in Antarctica, scientists have discovered a vast network of unfrozen salty groundwater that may support previously unknown microbial life deep under the coldest, driest 5 desert on our planet. The findings shed new light on ancient climate change on Earth and provide strong evidence that a similar briny aquifer could support microscopic life on Mars. The scientists used SkyTEM, an airborne electromagnetic sensor, to detect and map 10 otherwise inaccessible subterranean features.

The system uses an antennae suspended beneath a helicopter to create a magnetic field that reveals the subsurface to a depth of about 1,000 feet. Because a helicopter was used, large areas of rugged terrain could 15 be surveyed. The SkyTEM team was funded by the National Science Foundation and led by researchers from the University of Tennessee, Knoxville (UTK), and Dartmouth College, which oversees the NSF's SkyTEM project.

20 "These unfrozen materials appear to be relics of past surface ecosystems and our findings provide compelling evidence that they now provide deep subsurface habitats for microbial life despite extreme environmental conditions," says lead author Jill Mikucki, 25 an assistant professor at UTK. "These new below-ground visualization technologies can also provide insight on glacial dynamics and how Antarctica responds to climate change."

Co-author Dartmouth Professor Ross Virginia is 30 SkyTEM's co-principal investigator and director of Dartmouth's Institute of Arctic Studies. "This project is studying the past and present climate to, in part, understand how climate change in the future will affect biodiversity and ecosystem processes," Virginia says. 35 "This fantastic new view beneath the surface will help us sort out competing ideas about how the McMurdo Dry Valleys have changed with time and how this history influences what we see today."

The researchers found that the unfrozen brines form 40 extensive, interconnected aquifers deep beneath glaciers and lakes and within permanently frozen soils. The brines extend from the coast to at least 7.5 miles inland in the McMurdo Dry Valleys, the largest ice-free region in Antarctica. The brines could be due to freezing and/or 45 deposits. The findings show for the first time that the Dry Valleys' lakes are interconnected rather than isolated; connectivity between lakes and aquifers is important in sustaining ecosystems through drastic climate change, such as lake dry-down events. The findings also challenge

50 the assumption that parts of the ice sheets below the pressure melting point are devoid of liquid water. In addition to providing answers about the biological adaptations of previously unknown ecosystems that persist in the extreme cold and dark of the Antarctic 55 winter, the new study could help scientists to understand whether similar conditions might exist elsewhere in the solar system, specifically beneath the surface of Mars, which has many similarities to the Dry Valleys. Overall, the Dry Valleys ecosystem – 60 cold, vegetation-free and home only to microscopic animal and plant life – resembles, during the Antarctic summer, conditions on the surface on Mars.

SkyTEM produced images of Taylor Valley along the Ross Sea that suggest briny sediments exist at 65 subsurface temperatures down to perhaps -68°F, which is considered suitable for microbial life. One of the studied areas was lower Taylor Glacier, where the data suggest ancient brine still exists beneath the glacier. That conclusion is supported by the presence 70 of Blood Falls, an iron-rich brine that seeps out of the glacier and hosts an active microbial ecosystem.

Scientists' understanding of Antarctica's underground environment is changing dramatically as research reveals that subglacial lakes are widespread 75 and that at least half of the areas covered by the ice sheet are akin to wetlands on other continents. But groundwater in the ice-free regions and along the coastal margins remains poorly understood.

1

What do "the findings" (line 5) refer to?

2

What does "this history" (line 37) refer to?

3

What does "that conclusion" (line 69) refer to?

12. This passage is adapted from Sharon Tregaskis, "What Bees Tell Us About Global Climate Change," © 2010 by Johns Hopkins Magazine.

Standing in the apiary on the grounds of the U.S. Department of Agriculture's Bee Research Laboratory in Beltsville, Maryland, Wayne Esaias digs through the canvas shoulder bag leaning against his leg in search of 5 the cable he uses to download data. It's dusk as he runs the cord from his laptop—precariously perched on the beam of a cast-iron platform scale—to a small, battery-operated data logger attached to the spring inside the scale's steel column. In the 1800s, a scale like this 10 would have weighed sacks of grain or crates of apples, peaches, and melons. Since arriving at the USDA's bee lab in January 2007, this scale has been loaded with a single item: a colony of *Apis mellifera*, the fuzzy, black-and-yellow honey bee. An attached, 12-bit 15 recorder captures the hive's weight to within a 10th of a pound, along with a daily register of relative ambient humidity and temperature.

On this late January afternoon, during a comparatively balmy respite between the blizzards that 20 dumped several feet of snow on the Middle Atlantic states, the bees, their honey, and the wooden boxes in which they live weigh 94.5 pounds. In mid-July, as last year's unusually long nectar flow finally ebbed, the whole contraption topped out at 275 pounds, including 25 nearly 150 pounds of honey. "Right now, the colony is in a cluster about the size of a soccer ball," says Esaias, who's kept bees for nearly two decades and knows without lifting the lid what's going on inside this hive. "The center of the cluster is where the queen is, and 30 they're keeping her at 93 degrees—the rest are just hanging there, tensing their flight muscles to generate heat." Provided that they have enough calories to fuel their winter workout, a healthy colony can survive as far north as Anchorage, Alaska. "They slowly eat their 35 way up through the winter," he says. "It's a race: Will they eat all their honey before the nectar flows, or not?" To make sure their charges win that race, apiarists have long relied on scale hives for vital management clues. By tracking daily weight variations, a beekeeper can 40 discern when the colony needs a nutritional boost to carry it through lean times, whether to add extra combs for honey storage and even detect incursions by marauding robber bees—all without disturbing the colony. A graph of the hive's weight—which can

45 increase by as much as 35 pounds a day in some parts of the United States during peak nectar flow—reveals the date on which the bees' foraging was most productive and provides a direct record of successful pollination. "Around here, the bees make 50 their living in the month of May," says Esaias, noting that his bees often achieve daily spikes of 25 pounds, the maximum in Maryland. "There's almost no nectar coming in for the rest of the year." A scientist by training and career oceanographer at NASA, Esaias 55 established the Mink Hollow Apiary in his Highland, Maryland, backyard in 1992 with a trio of hand-made down hives and an antique platform scale much like the one at the Beltsville bee lab. Ever since, he's maintained a meticulous record of the bees' daily 60 weight, as well as weather patterns and such details as his efforts to keep them healthy. In late 2006, honey bees nationwide began disappearing in an ongoing syndrome dubbed colony collapse disorder (CCD). Entire hives went empty as bees inexplicably 65 abandoned their young and their honey. Commercial beekeepers reported losses up to 90 percent, and the large-scale farmers who rely on honey bees to ensure rich harvests of almonds, apples, and sunflowers became very, very nervous. Looking for clues, Esaias 70 turned to his own records. While the resulting graphs threw no light on the cause of CCD, a staggering trend emerged: In the span of just 15 seasons, the date on which his Mink Hollow bees brought home the most nectar had shifted by two weeks—from late May 75 to the middle of the month. "I was shocked when I plotted this up," he says. "It was right under my nose, going on the whole time." The epiphany would lead Esaias to launch a series of research collaborations, featuring honey bees and other pollinators, to 80 investigate the relationships among plants, pollinators, and weather patterns. Already, the work has begun to reveal insights into the often unintended consequences of human interventions in natural and agricultural ecosystems, and exposed significant 85 gaps in how we understand the effect climate change will have on everything from food production to terrestrial ecology.



What does "the epiphany" (line 77) refer to?



What does "the work" (line 81) refer to?

## The Big Picture Exercises

1. To understand what the new software—that is, analytics—can do that's different from more familiar software like spreadsheets, word processing, and graphics, consider the lowly photograph. Here the relevant facts aren't how many bytes constitute a digital photograph, or a billion of them. That's about as instructive as counting the silver halide molecules used to form a single old-fashioned print photo. The important feature of a digital image's bytes is that, unlike crystalline molecules, they are uniquely easy to store, transport, and manipulate with software. In the first era of digital images, people were fascinated by the convenience and malleability (think PhotoShop) of capturing, storing, and sharing pictures. Now, instead of using software to manage photos, we can mine features of the bytes that make up the digital image. Facebook can, without privacy invasion, track where and when, for example, vacationing is trending, since digital images reveal at least that much. But more importantly, those data can be cross-correlated, even in real time, with seemingly unrelated data such as local weather, interest rates, crime figures, and so on. Such correlations associated with just one photograph aren't revealing. But imagine looking at billions of photos over weeks, months, years, then correlating them with dozens of directly related data sets (vacation bookings, air traffic), tangential information (weather, interest rates, unemployment), or orthogonal information (social or political trends). With essentially free super-computing, we can mine and usefully associate massive, formerly unrelated data sets and unveil all manner of economic, cultural, and social realities.

For science fiction aficionados, Isaac Asimov anticipated the idea of using massive data sets to predict human behavior, coining it “psychohistory” in his 1951 Foundation trilogy. The bigger the data set, Asimov said then, the more predictable the future. With big-data analytics, one can finally see the forest, instead of just the capillaries in the tree leaves. Or to put it in more accurate terms, one can see beyond the apparently random motion of a few thousand molecules of air inside a balloon; one can see the balloon itself, and beyond that, that it is inflating, that it is yellow, and that it is part of a bunch of balloons en route to a birthday party. The data/software world has, until now, been largely about looking at the molecules inside one balloon.

1

The main idea of the passage is that

- A) Bytes have allowed people to capture and edit images in innovative ways.
- B) New forms of technology allow users' activities to be tracked without violating privacy.
- C) Recent developments in technology have transformed the way data is acquired and analyzed.
- D) Modern technology was described in science fiction novels long before it was invented.

2

The author's central claim in the second paragraph is that

- A) The predictions of science fiction writers tend to be more accurate than those of scientists.
- B) All human behavior can be understood through the use of massive data sets.
- C) Technological innovation is often inspired by the natural world.
- D) Data sets will reveal unforeseen relationships between large-scale phenomena.

2. This passage is adapted from Jamaica Kincaid, *Annie John*, © 1985 Farrar, Straus and Giroux. The protagonist is a girl growing up in the Caribbean.

It was the first day of a new term, Miss Nelson said, so we would not be attending to any of our usual subjects; instead, we were to spend the morning in contemplation and reflection and writing something she described as an “autobiographical essay.” In the afternoon, we would read aloud to each other our auto-biographical essays. (I knew quite well about “autobiography” and “essay,” but reflection and contemplation! A day at school spent in such a way! Of course, in most books all the good people were always contemplating and reflecting before they did anything. Perhaps in her mind’s eye she could see our future and, against all prediction, we turned out to be good people.) On hearing this, a huge sigh went up from the girls.

Half the sighs were in happiness at the thought of sitting and gazing off into clear space, the other half in unhappiness at the misdeeds that would have to go unaccomplished. I joined the happy half, because I knew it would please Miss Nelson, and, my own selfish interest aside, I liked so much the way she wore her ironed hair and her long-sleeved blouse and box-pleated skirt that I wanted to please her.

The morning was uneventful enough: a girl spilled ink from her inkwell all over her uniform; a girl broke her pen nib and then made a big to-do about replacing it; girls twisted and turned in their seats and pinched each other’s bottoms; girls passed notes to each other. All this Miss Nelson must have seen and heard, but she didn’t say anything—only kept reading her book: an elaborately illustrated edition of *The Tempest*, as later, passing by her desk, I saw. Midway in the morning, we were told to go out and stretch our legs and breathe some fresh air for a few minutes; when we returned, we were given glasses of cold lemonade and a slice of bun to refresh us.

As soon as the sun stood in the middle of the sky, we were sent home for lunch. The earth may have grown an inch or two larger between the time I had walked to school that morning and the time I went home to lunch, for some girls made a small space for me in their little band. But I couldn’t pay much attention to them; my mind was on my new surroundings, my new teacher, what I had written in my nice new notebook with its black-all-mixed-up-with-white cover and smooth lined pages (so glad was I to get rid of my old notebooks, which had on their covers a picture of a wrinkled-up woman wearing a crown on her head and a

neckful and armfuls of diamonds and pearls—their pages so coarse, as if they were made of cornmeal). I flew home. I must have eaten my food. By half past one, we were sitting under a flamboyant tree in a secluded part of our schoolyard, our auto-biographical essays in hand. We were about to read aloud what we had written during our morning of contemplation and reflection. In response to Miss Nelson, each girl stood up and read her composition. One girl told of a much revered and loved aunt who now lived in England and of how much she looked forward to one day moving to England to live with her aunt; one girl told of her brother studying medicine in Canada and the life she imagined he lived there (it seemed quite odd to me); one girl told of the fright she had when she dreamed she was dead, and of the matching fright she had when she woke and found that she wasn’t (everyone laughed at this, and Miss Nelson had to call us to order over and over); one girl told of how her oldest sister’s best friend’s cousin’s best friend (it was a real rigmarole) had gone on a Girl Guide jamboree held in Trinidad and met someone who millions of years ago had taken tea with Lady Baden-Powell; one girl told of an excursion she and her father had made to Redonda, and of how they had seen some booby birds tending their chicks. Things went on in that way, all so playful, all so imaginative. I began to wonder about what I had written, for it was the opposite of playful and it was the opposite of imaginative. What I had written was heartfelt, and, except for the very end, it was all too true.



Which choice best summarizes the passage?

- A) A character is apprehensive about attending new school but is reassured by her teacher.
- B) A character is excited about attending a new school but struggles to make friends.
- C) A character is eager to complete a school assignment but becomes anxious after observing her classmates’ work.
- D) A character admires her teacher but is disappointed by her teacher’s reaction to her work.

The primary purpose of the passage is to

- A) describe the interactions between a young girl and her peers.
- B) recount a memorable episode in a young girl's life.
- C) explain the influence of an important figure on a young girl's life.
- D) explore the consequences of a young girl's decision.

3. The following passage is adapted from Olympe de Gouges, *Declaration of the Rights of Women*. It was initially published in 1791, during the French Revolution, and was written in response to the *Declaration of the Rights of Man* (1789).

Woman, wake up; the toxin of reason is being heard throughout the whole universe; discover your rights. The powerful empire of nature is no longer surrounded by prejudice, fanaticism, superstition, and lies. The flame of truth has dispersed all the clouds of folly and usurpation. Enslaved man has multiplied his strength and needs recourse to yours to break his chains. Having become free, he has become unjust to his companion. Oh, women, women! When will you cease to be blind? What advantage have you received from the Revolution? A more pronounced scorn, a more marked disdain. In the centuries of corruption you ruled only over the weakness of men. The reclamation of your patrimony, based on the wise decrees of nature – what have you to dread from such a fine undertaking? Do you fear that our legislators, correctors of that morality, long ensnared by political practices now out of date, will only say again to you: women, what is there in common between you and us? Everything, you will have to answer. If they persist in their weakness in putting this hypocrisy in contradiction to their principles, courageously oppose the force of reason to the empty pretensions of superiority; unite yourselves beneath the standards of philosophy; deploy all the energy of your character. Regardless of what barriers confront you, it is in your power to free yourselves; you have only to want to. Let us pass not to the shocking tableau of what you have been in society; and since national education is in question at this moment, let us see whether our wise legislators will think judiciously about the education of women.

Women have done more harm than good. Constraint and dissimulation have been their lot. What force has robbed them of, ruse returned to them; they had recourse to all the resources of their charms, and the most irreproachable persons did not resist them. Poison and the sword were both subject to them; they commanded in crime as in fortune. The French government, especially, depended throughout the centuries on the nocturnal administrations of women; the cabinet could keep no secrets as a result of their indiscretions; all have been subject to the cupidity and ambition of this sex, formerly contemptible and respected, and since the revolution, respectable and scorned.

45 In this sort of contradictory situation, what remarks could I not make! I have but a moment to make them, but this moment will fix the attention of the remotest posterity. Under the Old Regime, all was vicious, all was guilty; but could not the amelioration of 50 conditions be perceived even in the substance of vices? A woman only had to be beautiful or lovable; when she possessed these two advantages, she saw a hundred fortunes at her feet. If she did not profit from them, she had a bizarre character or a rare philosophy 55 which made her scorn wealth; then she was deemed to be like a crazy woman. A young, inexperienced woman, seduced by a man whom she loves, will abandon her parents to follow him; the ingrate will leave her after a few years, and the older she has 60 become with him, the more inhuman is his inconstancy; if she has children, he will likewise abandon them. If he is rich, he will consider himself excused from sharing his fortune with his noble victims. If some involvement binds him to his duties, he will 65 deny them, trusting that the laws will support him. If he is married, any other obligation loses its rights. Then what laws remain to extirpate vice all the way to its root? The law of dividing wealth and public administration between men and women. It can easily 70 be seen that one who is born into a rich family gains very much from such equal sharing. But the one born into a poor family with merit and virtue – what is her lot? Poverty and opprobrium. If she does not precisely excel in music or painting, she cannot be admitted to 75 any public function when she has all the capacity for it.

### 1

The central problem that the author describes in the second paragraph (lines 32-44) is that women

- A) are encouraged by their husbands to secretly gather information.
- B) have played a significant but unacknowledged role in political life.
- C) have been responsible for undermining their own cause.
- D) must play a more active role in civic life.

The author's main point in the passage is that

- A) women and men must work together to improve conditions for women.
- B) women must excel in the arts in order to gain approval from society.
- C) women must unite to demand the rights that society has denied them.
- D) women's lack of rights can be primarily attributed to government policies.

4. The following passage is adapted from Julian Jackson, "New Research Suggests Dinosaurs Were Warm-Blooded and Active" © 2011 by Julian Jackson.

New research from the University of Adelaide has added to the debate about whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Professor Roger Seymour from the University's School 5 of Earth & Environmental Sciences has applied the latest theories of human and animal anatomy and physiology to provide insight into the lives of dinosaurs.

Human thigh bones have tiny holes – known as the 10 "nutrient foramen" – on the shaft that supply blood to living bone cells inside. New research has shown that the size of those holes is related to the maximum rate that a person can be active during aerobic exercise. Professor Seymour has used this principle to evaluate 15 the activity levels of dinosaurs.

"Far from being lifeless, bone cells have a relatively high metabolic rate and they therefore require a large blood supply to deliver oxygen. On the inside of the bone, the blood supply comes usually from a single 20 artery and vein that pass through a hole on the shaft – the nutrient foramen," he says.

Professor Seymour wondered whether the size of the nutrient foramen might indicate how much blood was necessary to keep the bones in good repair. For 25 example, highly active animals might cause more bone 'microfractures,' requiring more frequent repairs by the bone cells and therefore a greater blood supply. "My aim was to see whether we could use fossil bones of dinosaurs to indicate the level of bone metabolic rate 30 and possibly extend it to the whole body's metabolic rate," he says. "One of the big controversies among paleobiologists is whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Could the size of the foramen be a possible gauge for dinosaur 35 metabolic rate?"

Comparisons were made with the sizes of the holes in living mammals and reptiles, and their metabolic rates. Measuring mammals ranging from mice to elephants, and reptiles from lizards to crocodiles, one 40 of Professor Seymour's Honors students, Sarah Smith, combed the collections of Australian museums, photographing and measuring hundreds of tiny holes in thigh bones.

"The results were unequivocal. The sizes of the holes 45 were related closely to the maximum metabolic rates during peak movement in mammals and reptiles," Professor Seymour says. "The holes found in mammals were about 10 times larger than those in reptiles."

These holes were compared to those of fossil 50 dinosaurs. Dr. Don Henderson, Curator of Dinosaurs from the Royal Tyrrell Museum in Alberta, Canada, and Daniela Schwarz-Wings from the Museum für Naturkunde Humboldt University Berlin, Germany measured the holes in 10 species of 55 dinosaurs from five different groups, including bipedal and quadrupedal carnivores and herbivores, weighing 50kg to 20,000kg.

"On a relative comparison to eliminate the differences in body size, all of the dinosaurs had 60 holes in their thigh bones larger than those of mammals," Professor Seymour says.

"The dinosaurs appeared to be even more active than the mammals. We certainly didn't expect to see that. These results provide additional weight to 65 theories that dinosaurs were warm-blooded and highly active creatures, rather than cold-blooded and sluggish."

Professor Seymour says following the results of this study, it's likely that a simple measurement of 70 foramen size could be used to evaluate maximum activity levels in other vertebrate animals.



The main purpose of the passage is to

- A) Describe an experiment to resolve a scientific controversy and discuss its results.
- B) Refute a commonly held belief about dinosaur behavior.
- C) Compare the development of dinosaur bones to the development of mammal bones.
- D) Explain how foramen size has been used to gauge activity levels in mammals.

2

Which of the following best summarizes the findings of Professor Seymour's study?

- A) Foramen size can be used as a measure of growth rate in dinosaurs and other animals.
- B) The density of dinosaurs' thigh bones conclusively proves that dinosaurs were warm-blooded.
- C) The size of dinosaurs' foramens indicates that dinosaurs may have behaved more like mammals than like reptiles.
- D) The size of the holes in the shafts of dinosaurs' thigh bones strongly suggests that dinosaurs were warm-blooded.

5. This passage is adapted from a 1950 speech by Dean Acheson, who served as Secretary of State from 1949 to 1953 and strongly influenced United States foreign policy during the Cold War.

However much we may sympathize with the Soviet citizens who for reasons bedded deep in history are obliged to live under it, we are not attempting to change the governmental or social structure of the Soviet Union. The Soviet regime, however, has devoted a major portion of its energies and resources to the attempt to impose its system on other peoples. In this attempt it has shown itself prepared to resort to any method or stratagem, including subversion, threats, and even military force.

Therefore, if the two systems are to coexist, some acceptable means must be found to free the world from the destructive tensions and anxieties of which it has been the victim in these past years and the continuance of which can hardly be in the interests of any people.

I wish, therefore, to speak to you about those points of greatest difference which must be identified and sooner or later reconciled if the two systems are to live together, if not with mutual respect, at least in reasonable security.

It is now nearly 5 years since the end of hostilities, and the victorious Allies have been unable to define the terms of peace with the defeated countries. This is a grave, a deeply disturbing fact. For our part, we do not intend nor wish, in fact we do not know how, to create satellites. Nor can we accept a settlement which would make Germany, Japan, or liberated Austria satellites of the Soviet Union. The experience in Hungary, Rumania, and Bulgaria has been one of bitter disappointment and shocking betrayal of the solemn pledges by the wartime Allies. The Soviet leaders joined in the pledge at Tehran that they looked forward "with confidence to the day when all peoples of the world may live free lives, untouched by tyranny, and according to their varying desires and their own consciences." We can accept treaties of peace which would give reality to this pledge and to the interests of all in security.

With regard to the whole group of countries which we are accustomed to thinking of as the satellite area, the Soviet leaders could withdraw their military and police force and refrain from using the shadow of that force to keep in power persons or regimes which do not command the confidence of the respective peoples, freely expressed through orderly representative processes.

45 In this connection, we do not insist that these governments have any particular political or social complexion. What concerns us is that they should be truly independent national regimes, with a will of their own and with a decent foundation in popular feeling.

50 The Soviet leaders could cooperate with us to the end that the official representatives of all countries are treated everywhere with decency and respect and that an atmosphere is created in which these representatives could function in a normal and helpful manner,

55 conforming to the accepted codes of diplomacy.

These are some of the things which we feel that Soviet leaders could do which would permit the rational and peaceful development of the coexistence of their system and ours. They are not things that go to the depths of the moral conflict. They have been formulated by us, not as moralists but as servants of government, anxious to get on with the practical problems that lie before us and to get on with them in a manner consistent with mankind's deep longing for a respite from fear and uncertainty.

Nor have they been formulated as a one-sided bargain. A will to achieve binding, peaceful settlements would be required of all participants. All would have to produce unmistakable evidence of their good faith.

70 All would have to accept agreements in the observance of which all nations could have real confidence.

The United States is ready, as it has been and always will be, to cooperate in genuine efforts to find peaceful settlements. Our attitude is not inflexible, our opinions

75 are not frozen, our positions are not and will not be obstacles to peace. But it takes more than one to cooperate. If the Soviet Union could join in doing these things I have outlined, we could all face the future with greater security. We could look forward to more than 80 the eventual reduction of some of the present tensions. We could anticipate a return to a more normal and relaxed diplomatic atmosphere and to progress in the transaction of some of the international business which needs so urgently to be done.

1

What is the main idea of the passage?

- A) The Soviet Union's failure to adhere to international agreements poses an immediate threat to American security.
- B) Relations between the Soviet Union and the United States will improve if the Soviet Union permits its satellite states greater political self-determination.
- C) The Soviet Union will be unable to conduct normal relations with other countries until communism has been thoroughly destroyed.
- D) The conduct of the United States toward the Soviet Union is a moral dilemma that cannot be easily resolved.

2

The primary purpose of the passage is to

- A) Criticize the Soviet Union for its harsh treatment of peoples under its rule.
- B) Suggest that the Soviet Union should model its diplomatic process on that of the United States.
- C) Propose a course of action that would result in a reduction of tension between the Soviet Union and the United States.
- D) Decry the use of a force as a tool for maintaining international order.

3

The main idea of the fourth paragraph (lines 21-37) is that

- A) Leaders must act according to their conscience as well as their desires.
- B) Control of Soviet satellites will be granted to the United States if the Soviet Union continues to behave unreliably.
- C) Soviet control of Germany, Japan, and Austria would inevitably end in disaster.
- D) The Soviet Union must abide by its promises in order for the United States to accept its treaties.

6. The following passage is adapted from George Orwell, "Keep the Aspidistra Flying," first published in 1936. Gordon, the protagonist, is a poet.

Gordon walked homeward against the rattling wind, which blew his hair backward and gave him more of a 'good' forehead than ever. His manner conveyed to the passers-by – at least, he hoped it did – that if he wore

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Mrs. Wisbeach's face emerged, inspected him briefly but suspiciously, and disappeared again. It was quite impossible to get in or out of the house, at any time before eleven at night, without being scrutinized in this

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was hard to say. She was one of those malignant respectable women who keep lodging-houses. Age about forty-five, stout but active, with a pink, fine-featured, horribly observant face, beautifully grey hair,

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55 the sort of furniture you expect in a top floor back.

White-quilted single-bed; brown lino floor-covering; wash-hand-stand with jug and basin of that cheap white ware which you can never see without thinking of chamberpots. On the window-sill there was a sickly

60 aspidistra in a green-glazed pot.

Up against this, under the window, there was a kitchen table with an inkstained green cloth. This was Gordon's 'writing' table. It was only after a bitter struggle that he had induced Mrs. Wisbeach to give him

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table – a mere stand for the aspidistra – which she considered proper for a top floor back. And even now there was endless nagging because Gordon would never allow his table to be 'tidied up.' The table was in a

70 permanent mess. It was almost covered with a muddle

of papers, perhaps two hundred sheets, grimy and dog-eared, and all written on and crossed out and written on again – a sort of sordid labyrinth of papers to which only Gordon possessed the key. There was a film of

75 dust over everything. Except for a few books on the mantelpiece, this table, with its mess of papers, was the sole mark Gordon's personality had left on the room.

\*a bulbous plant with broad leaves, often used as a houseplant.

1

Which choice correctly states the order of events in the passage?

- A) A character arrives home, is briefly observed by another character, and retires unhappily to his room.
- B) A character arrives home, finds a letter that he has been expecting, and races to his room to read it.
- C) A character sneaks into his house, then is stopped by another character with whom he has an unpleasant encounter.
- D) A character who is waiting for a letter learns that it has not been sent; later, he narrowly avoids being seen by another character.

2

The primary purpose of the passage is to

- A) describe the habits of a somewhat eccentric character.
- B) illustrate the difficulties involved in being a writer.
- C) foreshadow an ominous development in a character's life.
- D) depict an unusual occurrence in a character's routine.

## Supporting and Contradicting Claims Exercises

1. The sharing economy is a little like online shopping, which started in America 15 years ago. At first, people were worried about security. But having made a successful purchase from, say, Amazon, they 5 felt safe buying elsewhere. Similarly, using Airbnb or a car-hire service for the first time encourages people to try other offerings. Next, consider eBay. Having started out as a peer-to-peer marketplace, it is now dominated by professional “power sellers” (many of whom started 10 out as ordinary eBay users). The same may happen with the sharing economy, which also provides new opportunities for enterprise. Some people have bought cars solely to rent them out, for example. Incumbents are getting involved too. Avis, a car-hire firm, has a share 15 in a sharing rival. So do GM and Daimler, two carmakers. In the future, companies may develop hybrid models, listing excess capacity (whether vehicles, equipment or office space) on peer-to-peer rental sites. In the past, new ways of doing things online have not displaced the 20 old ways entirely. But they have often changed them. Just as internet shopping forced Walmart and Tesco to adapt, so online sharing will shake up transport, tourism, equipment-hire and more.

The main worry is regulatory uncertainty. Will 25 room-4-renters be subject to hotel taxes, for example? In Amsterdam officials are using Airbnb listings to track down unlicensed hotels. In some American cities, peer-to-peer taxi services have been banned after lobbying by traditional taxi firms. The danger is that 30 although some rules need to be updated to protect consumers from harm, incumbents will try to destroy competition. People who rent out rooms should pay tax, of course, but they should not be regulated like a Ritz-Carlton hotel. The lighter rules that typically govern 35 bed-and-breakfasts are more than adequate. The sharing economy is the latest example of the internet’s value to consumers. This emerging model is now big and disruptive enough for regulators and companies to have woken up to it. That is a sign of its immense potential. It 40 is time to start caring about sharing.



Which choice provides the best evidence for the author’s claim that sharing-based companies may face serious challenges from established companies?

- A) Lines 5-7 (“Similarly...offerings”)
- B) Lines 14-15 (“Avis...rival”)
- C) Lines 27-29 (“In...firms”)
- D) Lines 32-34 (“People...hotel”)

2. This passage is adapted from Abraham Lincoln's First Inaugural Address, delivered in 1861.

I hold that in contemplation of universal law and of the Constitution the Union of these States is perpetual...

If the United States be not a government proper, but an association of States in the nature of contract merely, can it, as a contract, be peaceably unmade by less than all the parties who made it? One party to a contract may violate it—break it, so to speak—but does it not require all to lawfully rescind it?

10 Descending from these general principles, we find the proposition that in legal contemplation the Union is perpetual confirmed by the history of the Union itself. The Union is much older than the Constitution. It was formed, in fact, by the Articles of Association in 1774.

15 It was matured and continued by the Declaration of Independence in 1776. It was further matured, and the faith of all the then thirteen States expressly plighted and engaged that it should be perpetual, by the Articles of Confederation in 1788. And finally, in 1787, one of

20 the declared objects for ordaining and establishing the Constitution was "to form a more perfect Union."

But if destruction of the Union by one or by a part only of the States be lawfully possible, the Union is less perfect than before the Constitution, having lost the

25 vital element of perpetuity.

It follows from these views that no State upon its own mere motion can lawfully get out of the Union; that resolves and ordinances to that effect are legally void, and that acts of violence within any State or

30 States against the authority of the United States are insurrectionary or revolutionary, according to circumstances.

I therefore consider that in view of the Constitution and the laws the Union is unbroken, and to the extent of

35 my ability, I shall take care, as the Constitution itself expressly enjoins upon me, that the laws of the Union be faithfully executed in all the States...

In doing this there needs to be no bloodshed or violence, and there shall be none unless it be forced

40 upon the national authority. The power confided to me will be used to hold, occupy, and possess the property and places belonging to the Government and to collect the duties and imposts; but beyond what may be necessary for these objects, there will be no invasion, no

45 using of force against or among the people anywhere.

Where hostility to the United States in any interior locality shall be so great and universal as to prevent competent resident citizens from holding the Federal

offices, there will be no attempt to force obnoxious strangers among the people for that object. While the strict legal right may exist in the Government to enforce the exercise of these offices, the attempt to do so would be so irritating and so nearly impracticable withal that I deem it better to forego for the time the uses of such offices.



Which choice provides the best support for Lincoln's claim that the Union must be preserved as a whole?

- A) Lines 29-31 ("acts...revolutionary")
- B) Lines 35-37 ("I shall...States")
- C) Lines 40-42 ("The power...Government")
- D) Lines 46-50 ("Where...object")

3. The following passage is adapted from Olympe de Gouges, *Declaration of the Rights of Women*. It was initially published in 1791, during the French Revolution, and was written in response to the *Declaration of the Rights of Man* (1789).

Woman, wake up; the toxin of reason is being heard throughout the whole universe; discover your rights. The powerful empire of nature is no longer surrounded by prejudice, fanaticism, superstition, and lies. The flame of truth has dispersed all the clouds of folly and usurpation. Enslaved man has multiplied his strength and needs recourse to yours to break his chains. Having become free, he has become unjust to his companion. Oh, women, women! When will you cease to be blind? What advantage have you received from the Revolution? A more pronounced scorn, a more marked disdain. In the centuries of corruption you ruled only over the weakness of men. The reclamation of your patrimony, based on the wise decrees of nature – what have you to dread from such a fine undertaking? Do you fear that our legislators, correctors of that morality, long ensnared by political practices now out of date, will only say again to you: women, what is there in common between you and us? Everything, you will have to answer. If they persist in their weakness in putting this hypocrisy in contradiction to their principles, courageously oppose the force of reason to the empty pretensions of superiority; unite yourselves beneath the standards of philosophy; deploy all the energy of your character. Regardless of what barriers confront you, it is in your power to free yourselves; you have only to want to. Let us pass not to the shocking tableau of what you have been in society; and since national education is in question at this moment, let us see whether our wise legislators will think judiciously about the education of women.

Women have done more harm than good. Constraint and dissimulation have been their lot. What force has robbed them of, ruse returned to them; they had recourse to all the resources of their charms, and the most irreproachable persons did not resist them. Poison and the sword were both subject to them; they commanded in crime as in fortune. The French government, especially, depended throughout the centuries on the nocturnal administrations of women; the cabinet could keep no secrets as a result of their indiscretions; all have been subject to the cupidity and ambition of this sex, formerly contemptible and respected, and since the revolution, respectable and scorned.

45 In this sort of contradictory situation, what remarks could I not make! I have but a moment to make them, but this moment will fix the attention of the remotest posterity. Under the Old Regime, all was vicious, all was guilty; but could not the amelioration of 50 conditions be perceived even in the substance of vices? A woman only had to be beautiful or amiable; when she possessed these two advantages, she saw a hundred fortunes at her feet. If she did not profit from them, she had a bizarre character or a rare philosophy 55 which made her scorn wealth; then she was deemed to be like a crazy woman. A young, inexperienced woman, seduced by a man whom she loves, will abandon her parents to follow him; the ingrate will leave her after a few years, and the older she has 60 become with him, the more inhuman is his inconstancy; if she has children, he will likewise abandon them. If he is rich, he will consider himself excused from sharing his fortune with his noble victims. If some involvement binds him to his duties, he will 65 deny them, trusting that the laws will support him. If he is married, any other obligation loses its rights. Then what laws remain to extirpate vice all the way to its root? The law of dividing wealth and public administration between men and women. It can easily 70 be seen that one who is born into a rich family gains very much from such equal sharing. But the one born into a poor family with merit and virtue – what is her lot? Poverty and opprobrium. If she does not precisely excel in music or painting, she cannot be admitted to 75 any public function when she has all the capacity for it.

1

Which choice most effectively supports the author's claim that women have undermined their own cause?

- A) Lines 40-41 ("the cabinet...indiscretions")
- B) Lines 53-55 ("If...wealth")
- C) Lines 59-61 ("the older...inconstancy")
- D) Lines 73-75 ("If...for it")

4. The following passage is adapted from "Makerspaces, Hackerspaces, and Community Scale Production in Detroit and Beyond," © 2013 by Sean Ansanelli.

During the mid-1980s, spaces began to emerge across Europe where computer hackers could convene for mutual support and camaraderie. In the past few years, the idea of fostering such shared, physical spaces has been rapidly adapted by the diverse and growing community of "makers," who seek to apply the idea of "hacking" to physical objects, processes, or anything else that can be deciphered and improved upon.

A hackerspace is described by [hackerspaces.org](http://hackerspaces.org) as a "community-operated physical space where people with common interests, often in computers, technology, science, digital art or electronic art, can meet, socialize, and/or collaborate." Such spaces can vary in size, available technology, and membership structure (some being completely open), but generally share community-oriented characteristics. Indeed, while the term "hacker" can sometimes have negative connotations, modern hackerspaces thrive off of community, openness, and assimilating diverse viewpoints – these often being the only guiding principles in otherwise informal organizational structures.

In recent years, the city of Detroit has emerged as a hotbed for hackerspaces and other DIY ("Do-It-Yourself") experiments. Several hackerspaces can already be found throughout the city and several more are currently in formation. Of course, Detroit's attractiveness for such projects can be partially attributed to cheap real estate, which allows aspiring hackers to acquire ample space for experimentation. Some observers have also described this kind of making and tinkering as embedded in the DNA of Detroit's residents, who are able to harness substantial intergenerational knowledge and attract like-minded individuals.

Hackerspaces (or "makerspaces") can be found in more commercial forms, but the vast majority of spaces are self-organized and not-for-profit. For example, the OmniCorp hackerspace operates off member fees to cover rent and new equipment, from laser cutters to welding tools. OmniCorp also hosts an "open hack night" every Thursday in which the space is open to the general public. Potential members are required to attend at least one open hack night prior to a consensus vote by the existing members for admittance; no prospective members have yet been denied.

A visit to one of OmniCorp's open hack nights reveals the vast variety of activity and energy existing in the space. In the main common room alone, activities range from experimenting with sound installations and

learning to program Arduino boards to building speculative "loid" shapes – all just for the sake of it. With a general atmosphere of mutual support, participants in the space are continually encouraged to help others.

One of the most active community-focused initiatives in the city is the Mt. Elliot Makerspace. Jeff Sturges, former MIT Media Lab Fellow and Co-Founder of OmniCorp, started the Mt. Elliot project with the aim of replicating MIT's Fab Lab model on a smaller, cheaper scale in Detroit. "Fab Labs" are production facilities that consist of a small collection of flexible computer-controlled tools that cover several different scales and various materials, with the aim to make "almost anything" (including other machines). The Mt. Elliot Makerspace now offers youth-based skill development programs in eight areas: Transportation, Electronics, Digital Tools, Wearables, Design and Fabrication, Food, Music, and Arts. The range of activities is meant to provide not only something for everyone, but a well-rounded base knowledge of making to all participants.

While the center receives some foundational support, the space also derives significant support from the local community. Makerspaces throughout the city connect the space's youth-based programming directly to school curriculums.

The growing interest in and development of hacker/makerspaces has been explained, in part, as a result of the growing maker movement. Through the combination of cultural norms and communication channels from open source production as well as increasingly available technologies for physical production, amateur maker communities have developed in virtual and physical spaces.

1

Which choice best supports the author's claim that hackerspaces are generally welcoming and tolerant organizations?

- A) Lines 24-26 ("Several...formation")
- B) Lines 44-45 ("no...denied")
- C) Lines 48-51 ("In...shapes")
- D) Lines 71-73 ("While...community")

5. The following passage is adapted from "The Origin of the Ocean Floor" by Peter Kelemen, © 2009 by The National Geographic Society.

At the dark bottom of our cool oceans, 85 percent of the earth's volcanic eruptions proceed virtually unnoticed. Though unseen, they are hardly insignificant. Submarine volcanoes generate the solid underpinnings of all the world's oceans massive slabs of rock seven kilometers thick.

Geophysicists first began to appreciate the smoldering origins of the land under the sea, known formally as ocean crust, in the early 1960s. Sonar surveys revealed that volcanoes form nearly continuous ridges that wind around the globe like seams on a baseball. Later, the same scientists strove to explain what fuels these erupting mountain ranges, called mid-ocean ridges. Basic theories suggest that because ocean crust pulls apart along the ridges, hot material deep within the earth's rocky interior must rise to fill the gap. But details of exactly where the lava originates and how it travels to the surface long remained a mystery.

In recent years mathematical models of the interaction between molten and solid rock have provided some answers, as have examinations of blocks of old seafloor now exposed on the continents. These insights made it possible to develop a detailed theory describing the birth of ocean crust. The process turns out to be quite different from the typical layperson's idea, in which fiery magma fills an enormous chamber underneath a volcano, then rages upward along a jagged crack. Instead the process begins dozens of kilometers under the seafloor, where tiny droplets of melted rock ooze through microscopic pores at a rate of about 10 centimeters a year, about as fast as fingernails grow.

Closer to the surface, the process speeds up, culminating with massive streams of lava pouring over the seafloor with the velocity of a speeding truck. Deciphering how liquid moves through solid rock deep underground not only explains how ocean crust emerges but also may elucidate the behavior of other fluid-transport networks, including the river systems that dissect the planet's surface.

Far below the mid-ocean ridge volcanoes and their countless layers of crust-forming lava is the mantle, a 3,200-kilometer-thick layer of scorching hot rock that forms the earth's midsection and surrounds its metallic core. At the planet's cool surface, upthrusted mantle rocks are dark green, but if you could see them in their rightful home, they would be glowing red- or even white-hot. The top of the mantle is about 1,300 degrees Celsius, and it gets about one degree

50 hotter with each kilometer of depth. The weight of overlying rock means the pressure also increases with depth about 1,000 atmospheres for every three kilometers.

Knowledge of the intense heat and pressure in the mantle led researchers to hypothesize in the late 1960s that ocean crust originates as tiny amounts of liquid rock known as melt almost as though the solid rocks were "sweating." Even a minuscule release of pressure (because of material rising from

60 its original position) causes melt to form in microscopic pores deep within the mantle rock.

Explaining how the rock sweat gets to the surface was more difficult. Melt is less dense than the mantle rocks in which it forms, so it will constantly try to migrate upward, toward regions of lower pressure. But what laboratory experiments revealed about the chemical composition of melt did not seem to match up with the composition of rock samples collected from the mid-ocean ridges,

70 where erupted melt hardens.

Using specialized equipment to heat and squeeze crystals from mantle rocks in the laboratory, investigators learned that the chemical composition of melt in the mantle varies depending on the depth

75 at which it forms; the composition is controlled by an exchange of atoms between the melt and the minerals that make up the solid rock it passes through. The experiments revealed that as melt rises, it dissolves one kind of mineral, orthopyroxene, and

80 precipitates, or leaves behind, another mineral, olivine. Researchers could thus infer that the higher in the mantle melt formed, the more orthopyroxene it would dissolve, and the more olivine it would leave behind. Comparing these experimental findings

85 with lava samples from the mid-ocean ridges revealed that almost all of them have the composition of melts that formed at depths greater than 45 kilometers.

## II. Reading Comprehension

A student states that the ocean crust is formed by explosive volcanic eruptions. Is the student correct or incorrect, and which lines provide the best support?

- A) Correct, lines 14-16 ("Basic...gap")
- B) Correct, lines 26-28 ("fiery...crack")
- C) Incorrect, lines 30-33 ("tiny...grow")
- D) Incorrect, lines 45-48 ("At...white-hot")

## Literal Comprehension Exercises

1. The world is complex and interconnected, and the evolution of our communications system from a broadcast model to a networked one has added a new dimension to the mix. The Internet has made us all less dependent on professional journalists and editors for information about the wider world, allowing us to seek out information directly via online search or to receive it from friends through social media. But this enhanced convenience comes with a considerable risk: that we will be exposed to what we want to know at the expense of what we need to know. While we can find virtual communities that correspond to our every curiosity, there's little pushing us beyond our comfort zones to or into the unknown, even if the unknown may have serious implications for our lives. There are things we should probably know more about—like political and religious conflicts in Russia or basic geography. But even if we knew more than we do, there's no guarantee that the knowledge gained would prompt us to act in a particularly admirable fashion.

2. Chimps do it, birds do it, even you and I do it. Once you see someone yawn, you are compelled to do the same. Now it seems that wolves can be added to the list of animals known to spread yawns like a contagion. Among humans, even thinking about yawning can trigger the reflex, leading some to suspect that catching a yawn is linked to our ability to empathize with other humans. For instance, contagious yawning activates the same parts of the brain that govern empathy and social know-how. And some studies have shown that humans with more fine-tuned social skills are more likely to catch a yawn.

Similarly, chimpanzees, baboons and bonobos often yawn when they see other members of their species yawning. Chimps (*Pan troglodytes*) can catch yawns from humans, even virtual ones. At least in primates, contagious yawning seems to require an emotional connection and may function as a demonstration of empathy. Beyond primates, though, the trends are less clear-cut. One study found evidence of contagious yawning in birds but didn't connect it to empathy. A 2008 study showed that dogs (*Canis lupus familiaris*) could catch yawns from humans, and another showed that dogs were more likely to catch the yawn of a familiar human rather than a stranger. But efforts to see if dogs catch yawns from each other and to replicate the results have so far had no luck.

1. The passage indicates that internet users tend to seek information in a manner that is

- A) impulsive.
- B) unadventurous.
- C) creative.
- D) reckless.

2. Which choice provides the best evidence for the answer to the previous question?

- A) Lines 1-4 ("The world...mix")
- B) Lines 4-6 ("The Internet...world")
- C) Line 13 ("there's...zones")
- D) Lines 17-20 ("But...fashion")

1. The passage indicates that the people most likely to catch yawns are

- A) detail oriented.
- B) easily persuaded.
- C) attuned to others.
- D) chronically fatigued.

2. Which choice provides the best evidence for the answer to the previous question?

- A) Lines 3-5 ("Now...contagion")
- B) Lines 9-11 ("For...know-how")
- C) Lines 21-22 ("One...empathy")
- D) Lines 26-28 ("But...luck")

3

The passage indicates that the connection between empathy and yawning in birds and dogs, in comparison to humans, is

- A) more uncertain.
- B) less uncertain.
- C) impossible to establish.
- D) a controversial topic.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 3-4 (“Now...yawns”)
- B) Lines 14-16 (“Similarly...yawning”)
- C) Lines 20-21 (“Beyond...clear-cut”)
- D) Lines 23-26 (“A 2008...stranger”)

3. The following passage is adapted from George Orwell, "Keep the Aspidistra Flying," first published in 1936. Gordon, the protagonist, is a poet.

Gordon walked homeward against the rattling wind, which blew his hair backward and gave him more of a 'good' forehead than ever. His manner conveyed to the passers-by – at least, he hoped it did – that if he wore 5 no overcoat it was from pure caprice.

Willowbed Road, NW, was dingy and depressing, although it contrived to keep up a kind of mingy decency. There was even a dentist's brass plate on one of the houses. In quite two-thirds of them, amid the 10 lace curtains of the parlor window, there was a green card with 'Apartments' on it in silver lettering, above the peeping foliage of an aspidistra.\*

Mrs. Wisbeach, Gordon's landlady, specialized in 'single gentlemen.' Bed-sitting-rooms, with gaslight laid 15 on and find your own heating, baths extra (there was a geyser), and meals in the tomb-dark dining-room with the phalanx of clotted sauce-bottles in the middle of the table. Gordon, who came home for his midday dinner, paid twenty-seven and six a week.

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On the left of the hall was the never-used parlor, then came the staircase, and beyond that the passage ran down to the kitchen and to the unapproachable lair inhabited by Mrs. Wisbeach herself. As Gordon came in, 40 the door at the end of the passage opened a foot or so. Mrs. Wisbeach's face emerged, inspected him briefly but suspiciously, and disappeared again. It was quite impossible to get in or out of the house, at any time before eleven at night, without being scrutinized in this 45 manner. Just what Mrs. Wisbeach suspected you of it

was hard to say. She was one of those malignant respectable women who keep lodging-houses. Age about forty-five, stout but active, with a pink, fine-featured, horribly observant face, beautifully grey hair, 50 and a permanent grievance.

In the familiar darkness of his room, Gordon felt for the gas-jet and lighted it. The room was medium-sized, not big enough to be curtained into two, but too big to be sufficiently warmed by one defective oil lamp. It had 55 the sort of furniture you expect in a top floor back.

White-quilted single-bed; brown lino floor-covering; wash-hand-stand with jug and basin of that cheap white ware which you can never see without thinking of chamberpots. On the window-sill there was a sickly 60 aspidistra in a green-glazed pot.

Up against this, under the window, there was a kitchen table with an inkstained green cloth. This was Gordon's 'writing' table. It was only after a bitter struggle that he had induced Mrs. Wisbeach to give him 65 a kitchen table instead of the bamboo 'occasional' table – a mere stand for the aspidistra – which she considered proper for a top floor back. And even now there was endless nagging because Gordon would never allow his table to be 'tidied up.' The table was in a 70 permanent mess. It was almost covered with a muddle of papers, perhaps two hundred sheets, grimy and dog-eared, and all written on and crossed out and written on again – a sort of sordid labyrinth of papers to which only Gordon possessed the key. There was a film of 75 dust over everything. Except for a few books on the mantelpiece, this table, with its mess of papers, was the sole mark Gordon's personality had left on the room.

\*a bulbous plant with broad leaves, often used as a houseplant.

Based on the passage, "that kind of house" (line 22) is one that is

- A) large and rambling.
- B) gloomy and rundown.
- C) tidy and cheerful.
- D) utterly neglected.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 6-8 (“Willowbed...decency”)
- B) Lines 9-12 (“In...apidastra”)
- C) Lines 18-19 (“Gordon...week”)
- D) Lines 26-28 (“He...hope”)

3

The passage indicates that the encounter between Gordon and Mrs. Wisbeach was

- A) inevitable.
- B) drawn out.
- C) cordial.
- D) unexpected.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 32-33 (“The one...home”)
- B) Lines 36-39 (“On...herself”)
- C) Lines 42-45 (“It was...manner”)
- D) Lines 46-50 (“She...grievance”)

5

The narrator indicates that the papers in Gordon's room were

- A) an unrecognized masterpiece.
- B) hidden from view.
- C) a source of embarrassment.
- D) comprehensible to Gordon alone.

6

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 52-55 (“The room...back”)
- B) Lines 63-65 (“It was...table”)
- C) Lines 73-74 (“a sort...key”)
- D) Lines 75-77 (“Except...room”)

4. The following passage is adapted from Wiebke Brauer, "The Miracle of Space," © 2014 by *Smart Magazine*.

Imagine a world where you share the available space with others: without signs, sidewalks, or bicycle lanes. A vision otherwise known as shared space – and one that becomes more and more relevant with 5 the crowding of our cities. While this might sound like urban science fiction or, possibly, impending chaos mixed with survival of the fittest, this particular concept is the declared dream of many traffic planners.

Shared space means streets freed of signs and 10 signals; streets solely governed by right of way, leaving road users to their own devices. In order to restructure public space, it removes all superfluous interventions and contradictory guidelines. Many countries are currently in the process of installing – or at least 15 discussing – such 'lawless' areas: Germany and the Netherlands, Denmark and the UK, Switzerland and the USA, but also Australia and New Zealand.

One could argue that shared spaces have been around for a long time, simply under different terms 20 and titles. Back in the 1970s, for example, residents enjoyed mixed traffic areas, traffic calming, and play streets. And yet, these were not quite the same: Shared space involves a new and radical push for equal rights of all road users, pedestrian and otherwise. And 25 while it was British urban designer Ben Hamilton-Baillie who coined the actual term, the concept itself was developed in the mid-1990s under former Dutch traffic manager Hans Monderman. Shortly before his death in 2006, Monderman explained the basic tenets 30 of shared space as such: "The problem with traffic engineers is that when there's a problem with a road, they always try to add something. To my mind, it's much better to remove things."

Indeed, studies have shown that in many places – 35 where signs and traffic lights have been removed and where each and every one is responsible for their own actions in ungoverned space – the rate of accidents goes down. The reason: the traditional strict separation between cars, cyclists, and pedestrians encourages 40 clashes at crossings. And although shared space requires cars to lower their speed, it also cuts down on journey times since it encourages a continuous flow of traffic instead of bringing it to a halt through traffic signals.

45 Monderman was utterly convinced that shared space would work anywhere in the world because, underneath it all, people are basically the same, despite any cultural differences. In an interview, he stated that "emotions and issues are the same everywhere. You should be able

- 50 to read a street like a book. If you insist on constantly guiding people and treating them like idiots, you shouldn't be surprised if they act like idiots after a while."

At the same time, the threat of looming idiocy 55 is not the most pressing reason for a future traffic management rethink. Recent city planning, for example, has evolved along the same lines around the world: think highways and flyovers dissecting the city's natural fabric, dedicated pedestrian zones, and 60 large shopping malls. Clear-cut boundaries between driving, work, life, and shopping are emphasized by a thicket of signs. The result: ultimate, well-ordered bleakness. At night, you might find yourself in an empty, soulless pedestrian zone. A lot of the time, 65 urbanization simply translates as uniformity.

In recent years, however, city and traffic planners have decided to tackle this issue with "road space attractiveness" measures to breathe new spirit into lifeless satellite towns. Their goal: a new definition 70 of space and mobility against the background that the notion of "might is right" – and only if those in power stick to the rules – is more than outdated. The unregulated and unorthodox approach of shared space makes it obvious to each and every individual 75 that this concept requires cooperation, that sharing is the new having.

Critics of Monderman and Hamilton-Baillie have voiced that no rules implies the inevitable return of "might is right." Yet who says that chaos 80 reigns in the absence of order? That's a questionable statement. Shared space certainly requires a new mindset and we can't expect a swift shift away from traditional traffic planning – bigger, further, faster.

But the vision of no more set traffic cycles, fewer 85 linear and predefined patterns, of freely flowing and intermingling participants in an open and boundless space, is equally unfettered and fascinating. A vision in the spirit of Pericles who wrote around 450 BC that "you need freedom for happiness and courage 90 for freedom."

1

The passage indicates that in areas where traffic signals are removed, traveling becomes

- A) safer and less time consuming.
- B) safer and more time consuming.
- C) more dangerous and less time consuming.
- D) more dangerous and more time consuming.

2

According to the author, recent city planning has primarily resulted in

- A) isolated neighborhoods.
- B) a lack of variety.
- C) stylistic incoherence.
- D) urban revitalization.

3

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 13-15 (“Many...areas”)
- B) Lines 30-32 (“The problem...things”)
- C) Lines 48-49 (“emotions ...everywhere”)
- D) Lines 64-65 (“A...uniformity”)

5. This passage is adapted from a 1950 speech by Dean Acheson, who served as Secretary of State from 1949 to 1953 and strongly influenced United States foreign policy during the Cold War.

However much we may sympathize with the Soviet citizens who for reasons bedded deep in history are obliged to live under it, we are not attempting to change the governmental or social structure of the Soviet Union. The Soviet regime, however, has devoted a major portion of its energies and resources to the attempt to impose its system on other peoples. In this attempt it has shown itself prepared to resort to any method or stratagem, including subversion, threats, and even military force.

Therefore, if the two systems are to coexist, some acceptable means must be found to free the world from the destructive tensions and anxieties of which it has been the victim in these past years and the continuance of which can hardly be in the interests of any people.

I wish, therefore, to speak to you about those points of greatest difference which must be identified and sooner or later reconciled if the two systems are to live together, if not with mutual respect, at least in reasonable security.

It is now nearly five years since the end of hostilities, and the victorious Allies have been unable to define the terms of peace with the defeated countries. This is a grave, a deeply disturbing fact. For our part, we do not intend nor wish, in fact we do not know how, to create satellites. Nor can we accept a settlement which would make Germany, Japan, or liberated Austria satellites of the Soviet Union. The experience in Hungary, Rumania, and Bulgaria has been one of bitter disappointment and shocking betrayal of the solemn pledges by the wartime Allies. The Soviet leaders joined in the pledge at Tehran that they looked forward "with confidence to the day when all peoples of the world may live free lives, untouched by tyranny, and according to their varying desires and their own consciences." We can accept treaties of peace which would give reality to this pledge and to the interests of all in security.

With regard to the whole group of countries which we are accustomed to thinking of as the satellite area, the Soviet leaders could withdraw their military and police force and refrain from using the shadow of that force to keep in power persons or regimes which do not command the confidence of the respective peoples, freely expressed through orderly representative processes.

45 In this connection, we do not insist that these governments have any particular political or social complexion. What concerns us is that they should be truly independent national regimes, with a will of their own and with a decent foundation in popular feeling.

50 The Soviet leaders could cooperate with us to the end that the official representatives of all countries are treated everywhere with decency and respect and that an atmosphere is created in which these representatives could function in a normal and helpful manner,

55 conforming to the accepted codes of diplomacy.

These are some of the things which we feel that Soviet leaders could do which would permit the rational and peaceful development of the coexistence of their system and ours. They are not things that go to the depths of the moral conflict. They have been formulated by us, not as moralists but as servants of government, anxious to get on with the practical problems that lie before us and to get on with them in a manner consistent with mankind's deep longing for a

65 respite from fear and uncertainty.

Nor have they been formulated as a one-sided bargain. A will to achieve binding, peaceful settlements would be required of all participants. All would have to produce unmistakable evidence of their good faith.

70 All would have to accept agreements in the observance of which all nations could have real confidence.

The United States is ready, as it has been and always will be, to cooperate in genuine efforts to find peaceful settlements. Our attitude is not inflexible, our opinions are not frozen, our positions are not and will not be obstacles to peace. But it takes more than one to cooperate. If the Soviet Union could join in doing these things I have outlined, we could all face the future with greater security. We could look forward to more than the eventual reduction of some of the present tensions. We could anticipate a return to a more normal and relaxed diplomatic atmosphere and to progress in the transaction of some of the international business which needs so urgently to be done.

1 What is the author's main point about regimes in the satellite area?

- A) Their leaders are susceptible to outside influences because they lack confidence.
- B) The United States would not dictate their policies as long as they were elected freely.
- C) They should model themselves directly on successful democracies.
- D) They should refrain from behaving aggressively toward neighboring countries.

2 Which choice provides the best evidence for the answer to the previous question?

- A) Lines 38-41 ("With...force")
- B) Lines 45-48 ("In...regimes")
- C) Lines 50-52 ("The Soviet...respect")
- D) Lines 67-68 ("A will...participants")

3 The author uses Hungary, Rumania, and Bulgaria (lines 28-29) as examples of

- A) Soviet leaders' betrayal of their pledge at Tehran.
- B) newly liberated satellites of the Soviet Union.
- C) countries that the United States want to transform into satellites.
- D) nations that have expressed the desire to accept peace treaties.

4 The author describes the Soviet Union as a regime characterized by

- A) flexibility.
- B) corruption.
- C) ruthlessness.
- D) loyalty.

5 Which choice provides the best evidence for the answer to the previous question?

- A) Lines 7-10 ("In...force")
- B) Lines 16-19 ("I...together")
- C) Lines 21-23 ("It is...countries")
- D) Lines 31-34 ("The Soviet...tyranny")

6. The following passage is adapted from "Scientists Discover Salty Aquifer, Previously Unknown Microbial Habitat Under Antarctica," © 2015 by Dartmouth College.

Using an airborne imaging system for the first time in Antarctica, scientists have discovered a vast network of unfrozen salty groundwater that may support previously unknown microbial life deep under the coldest, driest desert on our planet. The findings shed new light on ancient climate change on Earth and provide strong evidence that a similar briny aquifer could support microscopic life on Mars. The scientists used SkyTEM, an airborne electromagnetic sensor, to detect and map otherwise inaccessible subterranean features.

The system uses an antennae suspended beneath a helicopter to create a magnetic field that reveals the subsurface to a depth of about 1,000 feet. Because a helicopter was used, large areas of rugged terrain could be surveyed. The SkyTEM team was funded by the National Science Foundation and led by researchers from the University of Tennessee, Knoxville (UTK), and Dartmouth College, which oversees the NSF's SkyTEM project.

"These unfrozen materials appear to be relics of past surface ecosystems and our findings provide compelling evidence that they now provide deep subsurface habitats for microbial life despite extreme environmental conditions," says lead author Jill Mikucki, an assistant professor at UTK. "These new below-ground visualization technologies can also provide insight on glacial dynamics and how Antarctica responds to climate change."

Co-author Dartmouth Professor Ross Virginia is SkyTEM's co-principal investigator and director of Dartmouth's Institute of Arctic Studies. "This project is studying the past and present climate to, in part, understand how climate change in the future will affect biodiversity and ecosystem processes," Virginia says. "This fantastic new view beneath the surface will help us sort out competing ideas about how the McMurdo Dry Valleys have changed with time and how this history influences what we see today."

The researchers found that the unfrozen brines form extensive, interconnected aquifers deep beneath glaciers and lakes and within permanently frozen soils. The brines extend from the coast to at least 7.5 miles inland in the McMurdo Dry Valleys, the largest ice-free region in Antarctica. The brines could be due to freezing and/or deposits. The findings show for the first time that the Dry Valleys' lakes are interconnected rather than isolated; connectivity between lakes and aquifers is important in sustaining ecosystems through drastic climate change, such as lake dry-down events. The findings also challenge

the assumption that parts of the ice sheets below the pressure melting point are devoid of liquid water.

In addition to providing answers about the biological adaptations of previously unknown ecosystems that persist in the extreme cold and dark of the Antarctic winter, the new study could help scientists to understand whether similar conditions might exist elsewhere in the solar system, specifically beneath the surface of Mars, which has many similarities to the Dry Valleys. Overall, the Dry Valleys ecosystem – cold, vegetation-free and home only to microscopic animal and plant life – resembles, during the Antarctic summer, conditions on the surface on Mars.

SkyTEM produced images of Taylor Valley along the Ross Sea that suggest briny sediments exist at subsurface temperatures down to perhaps -68°F, which is considered suitable for microbial life. One of the studied areas was lower Taylor Glacier, where the data suggest ancient brine still exists beneath the glacier. That conclusion is supported by the presence of Blood Falls, an iron-rich brine that seeps out of the glacier and hosts an active microbial ecosystem.

Scientists' understanding of Antarctica's underground environment is changing dramatically as research reveals that subglacial lakes are widespread and that at least half of the areas covered by the ice sheet are akin to wetlands on other continents. But groundwater in the ice-free regions and along the coastal margins remains poorly understood.

1 The passage indicates that the "unfrozen salty groundwater" (line 3) was once

- A) contained in isolated lakes.
- B) locked in glaciers.
- C) devoid of any life.
- D) found at the earth's surface.

2 Which choice provides the best evidence for the answer to the previous question?

- A) Lines 5-6 ("The findings...Earth")
- B) Lines 20-21 ("These...ecosystems")
- C) Lines 31-34 ("This...processes")
- D) Lines 47-48 ("connectivity...change")

3

Based on the passage, a novel finding of the SkyTEM project was that

- A) shifting plates below the Antarctic surface can create major earthquakes.
- B) certain regions of Antarctica bear a similarity to the surface of Mars.
- C) interconnected lakes and aquifers create hardy ecosystems.
- D) biodiversity in Antarctica is decreasing rapidly as a result of climate change.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 8-10 (“The scientists...features”)
- B) Lines 25-28 (“These...change”)
- C) Lines 45-49 (“The findings...events”)
- D) Lines 75-76 (“at least...continents”)

7. The following passage is adapted from Jane Austen, *Northanger Abbey*, originally published in 1817.

No one who had ever seen Catherine Morland in her infancy would have supposed her born to be an heroine. Her situation in life, the character of her father and mother, her own person and disposition, were all 5 equally against her. Her father was a clergyman, without being neglected, or poor, and a very respectable man, though his name was Richard—and he had never been handsome. He had a considerable independence besides two good livings—and he was not in the least addicted 10 to locking up his daughters. Her mother was a woman of useful plain sense, with a good temper, and, what is more remarkable, with a good constitution. She had three sons before Catherine was born; and instead of dying in bringing the latter into the world, as anybody 15 might expect, she still lived on—lived to have six children more—to see them growing up around her, and to enjoy excellent health herself. A family of ten children will be always called a fine family, where there are heads and arms and legs enough for the number; 20 but the Morlands had little other right to the word, for they were in general very plain, and Catherine, for many years of her life, as plain as any. She had a thin awkward figure, a sallow skin without colour, dark lank hair, and strong features—so much for her person; and 25 not less unpropitious for heroism seemed her mind. She was fond of all boy's plays, and greatly preferred cricket not merely to dolls, but to the more heroic enjoyments of infancy, nursing a dormouse, feeding a canary-bird, or watering a rose-bush. Indeed she had 30 no taste for a garden; and if she gathered flowers at all, it was chiefly for the pleasure of mischief—at least so it was conjectured from her always preferring those which she was forbidden to take. Such were her propensities—her abilities were quite as extraordinary. 35 She never could learn or understand anything before she was taught; and sometimes not even then, for she was often inattentive, and occasionally stupid. Her mother was three months in teaching her only to repeat the "Beggar's Petition"; and after all, her 40 next sister, Sally, could say it better than she did. Not that Catherine was always stupid—by no means; she learnt the fable of "The Hare and Many Friends" as quickly as any girl in England. Her mother wished her to learn music; and Catherine was sure she should like it, 45 for she was very fond of tinkling the keys of the old forlorn spinner; so, at eight years old she began. She learnt a year, and could not bear it; and Mrs. Morland, who did not insist on her daughters being accomplished

in spite of incapacity or distaste, allowed her to leave 50 off. The day which dismissed the music-master was one of the happiest of Catherine's life. Her taste for drawing was not superior; though whenever she could obtain the outside of a letter from her mother or seize upon any other odd piece of paper, she did what she 55 could in that way, by drawing houses and trees, hens and chickens, all very much like one another. Writing and accounts she was taught by her father; French by her mother: her proficiency in either was not remarkable, and she shirked her lessons in both 60 whenever she could. What a strange, unaccountable character!—for with all these symptoms of profligacy at ten years old, she had neither a bad heart nor a bad temper, was seldom stubborn, scarcely ever quarrelsome, and very kind to the little ones, with 65 few interruptions of tyranny; she was moreover noisy and wild, hated confinement and cleanliness, and loved nothing so well in the world as rolling down the green slope at the back of the house.

1.

The narrator indicates that on the whole, the Morlands' appearance was

- A) unremarkable.
- B) intimidating.
- C) uncommonly attractive.
- D) somewhat peculiar.

2.

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 5-8 ("Her...handsome")
- B) Lines 10-12 ("Her...constitution")
- C) Lines 17-18 ("A family...family")
- D) Lines 20-21 ("but...plain")

3

As presented in the passage, Catherine could best be described as

- A) charming.
- B) heroic.
- C) rambunctious.
- D) gifted.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 30-31 (“and...mischief”)
- B) Lines 33-34 (“Such...extraordinary”)
- C) Line 41 (“Not...means”)
- D) Lines 65-66 (“she...cleanliness”)

5

The narrator indicates that Mrs. Morland was

- A) weak and sickly.
- B) sturdy and practical.
- C) short-tempered and irritable.
- D) creative and enthusiastic.

6

The passage indicates that Catherine responded to her parents’ lessons by

- A) participating eagerly.
- B) turning them into games.
- C) avoiding them if possible.
- D) refusing to pay attention.

## Inference Exercises

1. Conservationists have historically been at odds with the people who inhabit wildernesses. During the last half of the 20th century, millions of indigenous people were ousted from their homelands to establish nature sanctuaries free of humans. Most succumbed to malnutrition, disease and exploitation. Such outcomes—coupled with the realization that indigenous groups usually help to stabilize ecosystems by, for instance, keeping fire at bay—have convinced major conservation groups to take local human concerns into account. The World Wildlife Fund (WWF) now describes indigenous peoples as “natural allies,” and the Nature Conservancy pledges to seek their “free, informed and prior” consent to projects impacting their territories.

2. Chronic stress, it turns out, is extremely dangerous. While stress doesn’t cause any single disease — in fact, the causal link between stress and ulcers has been largely disproved — it makes most diseases significantly worse. The list of ailments connected to stress is staggeringly diverse and includes everything from the common cold and lower-back pain to Alzheimer’s disease, major depressive disorder, and heart attack. Stress hollows out our bones and atrophies our muscles. It triggers adult-onset diabetes and may also be connected to high blood pressure. In fact, numerous studies of human longevity in developed countries have found that psychosocial factors such as stress are the single most important variable in determining the length of a life. It’s not that genes and risk factors like smoking don’t matter. It’s that our levels of stress matter more.

Furthermore, the effects of chronic stress directly counteract improvements in medical care and public health. Antibiotics, for instance, are far less effective when our immune system is suppressed by stress; that fancy heart surgery will work only if the patient can learn to shed stress. As pioneering stress researcher Robert Sapolsky notes, “You can give a guy a drug-coated stent, but if you don’t fix the stress problem, it won’t really matter. For so many conditions, stress is the major long-term risk factor. Everything else is a short-term fix.”

1

It can be reasonably inferred from the passage that conservation groups

- A) were initially unaware that indigenous groups helped maintain ecosystems.
- B) have helped millions of indigenous people remain in their homelands.
- C) have gradually become more radical in their demands.
- D) have reduced outbreaks of disease among indigenous peoples.

1

The passage suggests that the effects of genes on human longevity

- A) are not yet fully understood.
- B) can be altered by certain medications.
- C) are less significant than the effects of stress.
- D) are entirely irrelevant when compared to the effects of stress.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 5-6 (“The list...diverse”)
- B) Lines 8-9 (“Stress...muscles”)
- C) Lines 14-16 (“It’s not...more”)
- D) Lines 19-20 (“Antibiotics...stress”)

3. The following passage is adapted from Jane Austen, *Northanger Abbey*, originally published in 1817.

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1

An unstated assumption in the narrator's description of Catherine is that a heroine is typically

- A) bold and daring.
- B) brilliant and beautiful.
- C) wild and rebellious.
- D) independent and carefree.

2

The narrator suggests that Catherine's mother responded to her daughter's behavior with

- A) frequent irritation.
- B) general indifference.
- C) easy indulgence.
- D) utter perplexity.

3

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 13-15 (“and...on”)
- B) Lines 20-21 (“for...plain”)
- C) Lines 38-40 (“Her...did”)
- D) Lines 47-50 (“and...off”)

4

The narrator implies that Catherine was strongly motivated to do things that

- A) were unusually difficult.
- B) were taught by her parents.
- C) were not permitted.
- D) her siblings were unable to accomplish.

5

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 26-27 (“She...dolls”)
- B) Lines 30-33 (“and...take”)
- C) Lines 43-44 (“Her...music”)
- D) Lines 54-56 (“she...another”)

6

The narrator’s references to a dormouse, canary-bird, and rose bush (lines 28-29) most strongly suggest that Catherine

- A) could behave in a cruel manner.
- B) preferred to play alone than with other children.
- C) rejected a range of conventionally feminine activities.
- D) was aware of her exceptional behavior.

4. The following passage is adapted from Wiebke Brauer, "The Miracle of Space," © 2014 by *Smart Magazine*.

Imagine a world where you share the available space with others: without signs, sidewalks, or bicycle lanes. A vision otherwise known as shared space – and one that becomes more and more relevant with the crowding of our cities. While this might sound like urban science fiction or, possibly, impending chaos mixed with survival of the fittest, this particular concept is the declared dream of many traffic planners.

Shared space means streets freed of signs and signals; streets solely governed by right of way, leaving road users to their own devices. In order to restructure public space, it removes all superfluous interventions and contradictory guidelines. Many countries are currently in the process of installing – or at least discussing – such 'lawless' areas: Germany and the Netherlands, Denmark and the UK, Switzerland and the USA, but also Australia and New Zealand.

One could argue that shared spaces have been around for a long time, simply under different terms and titles. Back in the 1970s, for example, residents enjoyed mixed traffic areas, traffic calming, and play streets. And yet, these were not quite the same: Shared space involves a new and radical push for equal rights of all road users, pedestrian and otherwise. And while it was British urban designer Ben Hamilton-Baillie who coined the actual term, the concept itself was developed in the mid-1990s under former Dutch traffic manager Hans Monderman. Shortly before his death in 2006, Monderman explained the basic tenets of shared space as such: "The problem with traffic engineers is that when there's a problem with a road, they always try to add something. To my mind, it's much better to remove things."

Indeed, studies have shown that in many places – where signs and traffic lights have been removed and where each and every one is responsible for their own actions in ungoverned space – the rate of accidents goes down. The reason: the traditional strict separation between cars, cyclists, and pedestrians encourages clashes at crossings. And although shared space requires cars to lower their speed, it also cuts down on journey times since it encourages a continuous flow of traffic instead of bringing it to a halt through traffic signals.

Monderman was utterly convinced that shared space would work anywhere in the world because, underneath it all, people are basically the same, despite any cultural differences. In an interview, he stated that "emotions and issues are the same everywhere. You should be able

to read a street like a book. If you insist on constantly guiding people and treating them like idiots, you shouldn't be surprised if they act like idiots after a while."

At the same time, the threat of looming idiocy is not the most pressing reason for a future traffic management rethink. Recent city planning, for example, has evolved along the same lines around the world: think highways and flyovers dissecting the city's natural fabric, dedicated pedestrian zones, and large shopping malls. Clear-cut boundaries between driving, work, life, and shopping are emphasized by a thicket of signs. The result: ultimate, well-ordered bleakness. At night, you might find yourself in an empty, soulless pedestrian zone. A lot of the time, urbanization simply translates as uniformity.

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Critics of Monderman and Hamilton-Baillie have voiced that no rules implies the inevitable return of "might is right." Yet who says that chaos reigns in the absence of order? That's a questionable statement. Shared space certainly requires a new mindset and we can't expect a swift shift away from traditional traffic planning – bigger, further, faster.

But the vision of no more set traffic cycles, fewer linear and predefined patterns, of freely flowing and intermingling participants in an open and boundless space, is equally unfettered and fascinating. A vision in the spirit of Pericles who wrote around 450 BC that "you need freedom for happiness and courage for freedom."

1

The passage suggests that the most pressing reason for overhauling the way traffic is managed is that

- A) the removal of traffic signal results in more varied and vibrant urban spaces.
- B) drivers are unlikely to take responsibility for their actions when they are left alone.
- C) overreliance on traffic signals makes drivers hesitant and indecisive.
- D) accidents are more likely to occur when traffic signals are present.

2

Based on the passage, it is reasonable to infer that those in charge of planning traffic

- A) are strongly opposed to Hans Monderman's proposal.
- B) believe that drivers' behavior does not vary across cultures.
- C) believe that abolishing traffic signals would lead to chaos.
- D) are frequently opposed to the use of traffic signals.

3

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 7-8 ("this...planners")
- B) Lines 20-22 ("Back...streets")
- C) Lines 50-53 ("If...while")
- D) Lines 56-58 ("Recent...world")

5. This passage is from Samuel Gompers, "What Does the Working Man Want?" 1890. Gompers, a Scottish Immigrant, was the founder of the American Federation of Labor and helped workers to organize and fight for fairer working conditions.

My friends, we have met here today to celebrate the idea that has prompted thousands of working-people of Louisville and New Albany to parade the streets; that prompts the toilers of Chicago to turn out by their 5 fifty or hundred thousand of men; that prompts the vast army of wage-workers in New York to demonstrate their enthusiasm and appreciation of the importance of this idea; that prompts the toilers of England, Ireland, Germany, France, Italy, Spain, and Austria to defy the 10 manifestos of the autocrats of the world and say that on May the first, 1890, the wage-workers of the world will lay down their tools in sympathy with the wage-workers of America, to establish a principle of limitations of hours of labor to eight hours for sleep, 15 eight hours for work, and eight hours for what we will.

It has been charged time and again that were we to have more hours of leisure we would merely devote it to the cultivation of vicious habits. They tell us that the eight-hour movement can not be enforced, for the 20 reason that it must check industrial and commercial progress. I say that the history of this shows the reverse. I say that is the plane on which this question ought to be discussed—that is the social question. As long as they make this question an economic one, I am willing to 25 discuss it with them. I would retrace every step I have taken to advance this movement did it mean industrial and commercial stagnation. But it does not mean that. It means greater prosperity; it means a greater degree of progress for the whole people.

30 They say they can't afford it. Is that true? Let us see for one moment. If a reduction in the hours of labor causes industrial and commercial ruination, it would naturally follow increased hours of labor would increase the prosperity, commercial and industrial.

35 If that were true, England and America ought to be at the tail end, and China at the head of civilization.

Why, when you reduce the hours of labor, just think what it means. Suppose men who work ten hours a day had the time lessened to nine, or men who 40 work nine hours a day have it reduced to eight; what does it mean? It means millions of golden hours and opportunities for thought. Some men might say you will go to sleep. Well, the ordinary man might try to sleep sixteen hours a day, but he would soon find he could 45 not do it long. He would probably become interested in some study and the hours that have been taken from manual labor are devoted to mental labor, and the

mental labor of one hour produce for him more wealth than the physical labor of a dozen hours.

- 50 I maintain that this is a true proposition—that men under the short-hour system not only have opportunity to improve themselves, but to make a greater degree of prosperity for their employers. Why, my friends, how is it in China, how is it in 55 Spain, how is it in India and Russia, how is it in Italy? Cast your eye throughout the universe and observe the industry that forces nature to yield up its fruits to man's necessities, and you will find that where the hours of labor are the shortest the progress of invention in 60 machinery and the prosperity of the people are the greatest. It has only been under the great influence of our great republic, were our people have exhibited their great senses, that we can move forward, upward and onward, and are watched with interest in our 65 movements of progress and reform.

1

Based on the passage, Gompers implies that in comparison to workers in the United States, workers in China (line 36)

- A) enjoy greater prosperity.
- B) are more industrious.
- C) spend more hours at work.
- D) are less fairly compensated.

2

Gompers suggests that one of the main consequences of long working hours in the United States is that

- A) civic participation is reduced.
- B) important discoveries go unmade.
- C) workers are too exhausted to perform their jobs.
- D) the quality of work declines.

3

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 16-18 ("It...habits")
- B) Lines 22-23 ("I...question")
- C) Lines 31-34 ("If...industrial")
- D) Lines 46-49 ("the hours...hours")

6. The following passage is adapted from Michael Anft, "Solving the Mystery of Death Valley's Walking Rocks," © 2011 by *Johns Hopkins Magazine*.

For six decades, observers have been confounded by the movement of large rocks across a dry lake bed in California's Death Valley National Park. Leaving flat trails behind them, rocks that weigh up to 100 pounds seemingly do Michael Jackson's moonwalk across the valley's sere, cracked surface, sometimes traveling more than 100 yards. Without a body of water to pick them up and move them, the rocks at Racetrack Playa, a flat space between the valley's high cliffs, 5 have been the subject of much speculation, including whether they have been relocated by human pranksters or space aliens. The rocks have become the desert equivalent of Midwestern crop circles. "They really are a curiosity," says Ralph Lorenz, a planetary scientist at 10 the Applied Physics Laboratory. "Some [people] have mentioned UFOs. But I've always believed that this is something science could solve."

It has tried. One theory holds that the rocks are blown along by powerful winds. Another posits that 20 the wind pushes thin sheets of ice, created when the desert's temperatures dip low enough to freeze water from a rare rainstorm, and the rocks go along for the ride. But neither theory is rock solid. Winds at the playa aren't strong enough—some scientists believe that 25 they'd have to be 100 miles per hour or more—to blow the rocks across the valley. And rocks subject to the "ice sailing theory" wouldn't create trails as they moved.

Lorenz and a team of investigators believe that a 30 combination of forces may work to rearrange Racetrack Playa's rocks. "We saw that it would take a lot of wind to move these rocks, which are larger than you'd expect wind to move," Lorenz explains. "That led us to this idea that ice might be picking up the 35 rocks and floating them." As they explained in the January issue of *The American Journal of Physics*, instead of moving along with wind-driven sheets of ice, the rocks may instead be lifted by the ice, making them more subject to the wind's force. The key, Lorenz 40 says, is that the lifting by an "ice collar" reduces friction with the ground, to the point that the wind now has enough force to move the rock. The rock moves, the ice doesn't, and because part of the rock juts through the ice, it marks the territory it has covered. 45 Lorenz's team came to its conclusion through a combination of intuition, lab work, and observation—not that the last part was easy. Watching the rocks travel is a bit like witnessing the rusting of a hubcap. Instances of movement are rare and last for only a few

50 seconds. Lorenz's team placed low-resolution cameras on the cliffs (which are about 30 miles from the nearest paved road) to take pictures once per hour. For the past three winters, the researchers have weathered extreme temperatures and several flat tires to measure how 55 often the thermometer dips below freezing, how often the playa gets rain and floods, and the strength of the winds. "The measurements seem to back up our hypothesis," he says. "Any of the theories may be true at any one time, but ice rafting may be the best explanation 60 for the trails we've been seeing. We've seen trails like this documented in Arctic coastal areas, and the mechanism is somewhat similar. A belt of ice surrounds a boulder during high tide, picks it up, and then drops it elsewhere." His "ice raft theory" was also 65 borne out by an experiment that used the ingenuity of a high school science fair. Lorenz placed a basalt pebble in a Tupperware container with water so that the pebble projected just above the surface. He then turned the container upside down in a baking tray filled with a 70 layer of coarse sand at its base, and put the whole thing in his home freezer. The rock's "keel" (its protruding part) projected downward into the sand, which simulated the cracked surface of the playa (which scientists call "Special K" because of its resemblance to cereal 75 flakes). A gentle push or slight puff of air caused the Tupperware container to move, just as an ice raft would under the right conditions. The pebble made a trail in the soft sand. "It was primitive but effective," Lorenz says of the experiment. Lorenz has spent the 80 last 20 years studying Titan, a moon of Saturn. He says that Racetrack Playa's surface mirrors that of a dried lakebed on Titan. Observations and experiments on Earth may yield clues to that moon's geology. "We also may get some idea of how climate affects 85 geology—particularly as the climate changes here on Earth," Lorenz says. "When we study other planets and their moons, we're forced to use Occam's razor—sometimes the simplest answer is best, which means you look to Earth for some answers. Once you get out 90 there on Earth, you realize how strange so much of its surface is. So, you have to figure there's weird stuff to be found on Titan as well." Whether that's true or not will take much more investigation. He adds: "One day, we'll figure all this out. For the moment, the moving 95 rock present a wonderful problem to study in a beautiful place."

1

It is reasonable to conclude that one of the scientists' goals in studying Racetrack Playa was to

- A) investigate how life could be supported on Titan.
- B) understand the effects of climate change.
- C) understand the geology of a range of planets.
- D) discover the limitations of wind power.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 23-26 (“Winds...valley”)
- B) Lines 52-57 (“For...winds”)
- C) Lines 75-77 (“A gentle...conditions”)
- D) Lines 83-86 (“We...Earth”)

3

The passage implies that scientists rejected the theory that the rocks were carried on sheets of ice pushed by the wind because

- A) the winds were too weak to move the rocks.
- B) the rocks left a trace of their movement.
- C) rock is too dense to be moved by wind.
- D) the rocks had too much friction with the ground.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 26-28 (“And...moved”)
- B) Lines 37-39 (“instead...force”)
- C) Lines 49-50 (“Instances...seconds”)
- D) Lines 62-64 (“A belt...elsewhere”)

7. The following passage is adapted from "Makerspaces, Hackerspaces, and Community Scale Production in Detroit and Beyond," © 2013 by Sean Ansanelli.

During the mid-1980s, spaces began to emerge across Europe where computer hackers could convene for mutual support and camaraderie. In the past few years, the idea of fostering such shared, physical spaces has been rapidly adapted by the diverse and growing community of "makers," who seek to apply the idea of "hacking" to physical objects, processes, or anything else that can be deciphered and improved upon.

A hackerspace is described by hackerspaces.org as a "community-operated physical space where people with common interests, often in computers, technology, science, digital art or electronic art, can meet, socialize, and/or collaborate." Such spaces can vary in size, available technology, and membership structure (some being completely open), but generally share community-oriented characteristics. Indeed, while the term "hacker" can sometimes have negative connotations, modern hackerspaces thrive off of community, openness, and assimilating diverse viewpoints – these often being the only guiding principles in otherwise informal organizational structures.

In recent years, the city of Detroit has emerged as a hotbed for hackerspaces and other DIY ("Do-It-Yourself") experiments. Several hackerspaces can already be found throughout the city and several more are currently in formation. Of course, Detroit's attractiveness for such projects can be partially attributed to cheap real estate, which allows aspiring hackers to acquire ample space for experimentation. Some observers have also described this kind of making and tinkering as embedded in the DNA of Detroit's residents, who are able to harness substantial intergenerational knowledge and attract like-minded individuals.

Hackerspaces (or "makerspaces") can be found in more commercial forms, but the vast majority of spaces are self-organized and not-for-profit. For example, the OmniCorp hackerspace operates off member fees to cover rent and new equipment, from laser cutters to welding tools. OmniCorp also hosts an "open hack night" every Thursday in which the space is open to the general public. Potential members are required to attend at least one open hack night prior to a consensus vote by the existing members for admittance; no prospective members have yet been denied.

A visit to one of OmniCorp's open hack nights reveals the vast variety of activity and energy existing in the space. In the main common room alone, activities range from experimenting with sound installations and

learning to program Arduino boards to building speculative "oloid" shapes – all just for the sake of it. With a general atmosphere of mutual support, participants in the space are continually encouraged to help others.

One of the most active community-focused initiatives in the city is the Mt. Elliot Makerspace. Jeff Sturges, former MIT Media Lab Fellow and Co-Founder of OmniCorp, started the Mt. Elliot project with the aim of replicating MIT's Fab Lab model on a smaller, cheaper scale in Detroit. "Fab Labs" are production facilities that consist of a small collection of flexible computer-controlled tools that cover several different scales and various materials, with the aim to make "almost anything" (including other machines). The Mt. Elliot Makerspace now offers youth-based skill development programs in eight areas: Transportation, Electronics, Digital Tools, Wearables, Design and Fabrication, Food, Music, and Arts. The range of activities is meant to provide not only something for everyone, but a well-rounded base knowledge of making to all participants.

While the center receives some foundational support, the space also derives significant support from the local community. Makerspaces throughout the city connect the space's youth-based programming directly to school curriculums.

The growing interest in and development of hacker/makerspaces has been explained, in part, as a result of the growing maker movement. Through the combination of cultural norms and communication channels from open source production as well as increasingly available technologies for physical production, amateur maker communities have developed in virtual and physical spaces.

Publications such as *Wired* are noticing the transformative potential of this emerging movement and have sought to devote significant attention to its development. Chief editor Chris Anderson recently published a book entitled *Makers*, in which he proclaims that the movement will become the next Industrial Revolution. Anderson argues such developments will allow for a new wave of business opportunities by providing mass-customization rather than mass-production.

The transformative potential of these trends goes beyond new business opportunities or competitive advantages for economic growth. Rather, these trends demonstrate the potential to actually transform economic development models entirely.

1

Based on the passage, it can be reasonably inferred that hackerspaces are organized in a manner that is

- A) strictly regulated.
- B) wild and chaotic.
- C) informal and accommodating.
- D) rigid and hierarchical.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 3-6 (“In...makers”)
- B) Lines 18-21 (“modern...structures”)
- C) Lines 35-37 (“Hackerspaces...profit”)
- D) Lines 46-48 (“A visit...space”)

3

The author implies that one potential challenge for new hackerspaces involves

- A) zoning restrictions.
- B) lack of publicity.
- C) local protests.
- D) property costs.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 16-17 (“Indeed...connotations”)
- B) Lines 26-29 (“Of...experimentation”)
- C) Lines 37-40 (“For...tools”)
- D) Lines 71-73 (“While...community”)

8. The following passage is adapted from Julian Jackson, "New Research Suggests Dinosaurs Were Warm-Blooded and Active" © 2011 by Julian Jackson.

New research from the University of Adelaide has added to the debate about whether dinosaurs were cold-blooded and sluggish or warm-blooded and active.

Professor Roger Seymour from the University's School 5 of Earth & Environmental Sciences has applied the latest theories of human and animal anatomy and physiology to provide insight into the lives of dinosaurs.

- Human thigh bones have tiny holes – known as the 10 "nutrient foramen" – on the shaft that supply blood to living bone cells inside. New research has shown that the size of those holes is related to the maximum rate that a person can be active during aerobic exercise. Professor Seymour has used this principle to evaluate 15 the activity levels of dinosaurs.

"Far from being lifeless, bone cells have a relatively high metabolic rate and they therefore require a large blood supply to deliver oxygen. On the inside of the bone, the blood supply comes usually from a single 20 artery and vein that pass through a hole on the shaft – the nutrient foramen," he says.

Professor Seymour wondered whether the size of the nutrient foramen might indicate how much blood was necessary to keep the bones in good repair. For 25 example, highly active animals might cause more bone 'microfractures,' requiring more frequent repairs by the bone cells and therefore a greater blood supply. "My aim was to see whether we could use fossil bones of dinosaurs to indicate the level of bone metabolic rate 30 and possibly extend it to the whole body's metabolic rate," he says. "One of the big controversies among paleobiologists is whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Could the size of the foramen be a possible gauge for dinosaur 35 metabolic rate?"

Comparisons were made with the sizes of the holes in living mammals and reptiles, and their metabolic rates. Measuring mammals ranging from mice to elephants, and reptiles from lizards to crocodiles, one 40 of Professor Seymour's Honors students, Sarah Smith, combed the collections of Australian museums, photographing and measuring hundreds of tiny holes in thigh bones.

"The results were unequivocal. The sizes of the holes 45 were related closely to the maximum metabolic rates during peak movement in mammals and reptiles," Professor Seymour says. "The holes found in mammals were about 10 times larger than those in reptiles."

These holes were compared to those of fossil 50 dinosaurs. Dr. Don Henderson, Curator of Dinosaurs from the Royal Tyrrell Museum in Alberta, Canada, and Daniela Schwarz-Wings from the Museum für Naturkunde Humboldt University Berlin, Germany measured the holes in 10 species of 55 dinosaurs from five different groups, including bipedal and quadrupedal carnivores and herbivores, weighing 50kg to 20,000kg.

"On a relative comparison to eliminate the differences in body size, all of the dinosaurs had 60 holes in their thigh bones larger than those of mammals," Professor Seymour says.

The dinosaurs appeared to be even more active than the mammals. We certainly didn't expect to see that. These results provide additional weight to 65 theories that dinosaurs were warm-blooded and highly active creatures, rather than cold-blooded and sluggish."

Professor Seymour says following the results of this study, it's likely that a simple measurement of 70 foramen size could be used to evaluate maximum activity levels in other vertebrate animals.

1.

Based on the passage, it can be reasonably inferred that a creature with a small foramen would most likely be

- A) cold-blooded.
- B) warm-blooded.
- C) smaller than average.
- D) larger than average.

2.

An unstated assumption in the passage is that

- A) warm- or cold-bloodedness cannot be determined by an animal's activity level.
- B) some prehistoric creatures were physiologically similar to modern ones.
- C) foramen size can be an unreliable indicator of activity level.
- D) mammal bones are significantly larger than reptile bones.

## Extended Reasoning and Analogy Exercises

1. Around the middle of the 20th century, science dispensed with the fantasy that we could easily colonize the other planets in our solar system. Science fiction writers absorbed the new reality: soon, moon and 5 asteroid settings replaced Mars and Venus.

2. Why is the connection between smells and memories so strong? The reason for these associations is that the brain's olfactory bulb is connected to both the amygdala (an emotion center) and to the 5 hippocampus, which is involved in memory. And, because smells serve a survival function (odors can keep us from eating spoiled or poisonous foods), some of these associations are made very quickly, and may even involve a one-time association.

3. Experimental scientists occupy themselves with observing and measuring the cosmos, finding out what stuff exists, no matter how strange that stuff may be. Theoretical physicists, on the other hand, are not 5 satisfied with observing the universe. They want to know why. They want to explain all the properties of the universe in terms of a few fundamental principles and parameters. These fundamental principles, in turn, lead to the "laws of nature," which govern the 10 behavior of all matter and energy.

Which of the following is most analogous to the situation described in the passage?

- A) A writer realizes that he is unlikely to become a successful novelist and accepts a job at a magazine instead.
- B) A musician continues to perform despite receiving unfavorable reviews from critics.
- C) A pilot is forced to make an emergency landing after encountering bad weather during a flight.
- D) A politician retires from office after becoming involved in a scandal.

As described in the passage, the connection between smells and memories is most like which of the following?

- A) a driver has an accident at an intersection and refuses to drive past it again.
- B) a child insists on wearing clothes of a particular color every day.
- C) a young woman inexplicably develops an allergy to a common household item.
- D) a food manufacturer develops a technology to prevent its products from spoiling.

Theoretical physicists' goal, as indicated in the passage, is most similar to which of the following?

- A) A biologist observing changes in a specimen over an extended period of time.
- B) Members of a community rebuilding a house destroyed in a storm.
- C) An astronaut undergoes years of training to prepare for a journey into space.
- D) A linguist seeking to discover the underlying features common to distantly related languages.

4. The sharing economy is a little like online shopping, which started in America 15 years ago. At first, people were worried about security. But having made a successful purchase from, say, Amazon, they 5 felt safe buying elsewhere. Similarly, using Airbnb or a car-hire service for the first time encourages people to try other offerings. Next, consider eBay. Having started out as a peer-to-peer marketplace, it is now dominated by professional “power sellers” (many of whom started 10 out as ordinary eBay users). The same may happen with the sharing economy, which also provides new opportunities for enterprise. Some people have bought cars solely to rent them out, for example. Incumbents are getting involved too. Avis, a car-hire firm, has a share 15 in a sharing rival. So do GM and Daimler, two carmakers. In the future, companies may develop hybrid models, listing excess capacity (whether vehicles, equipment or office space) on peer-to-peer rental sites. In the past, new ways of doing things online have not displaced the 20 old ways entirely. But they have often changed them. Just as internet shopping forced Walmart and Tesco to adapt, so online sharing will shake up transport, tourism, equipment-hire and more.

The main worry is regulatory uncertainty. Will

25 room-4-renters be subject to hotel taxes, for example? In Amsterdam officials are using Airbnb listings to track down unlicensed hotels. In some American cities, peer-to-peer taxi services have been banned after lobbying by traditional taxi firms. The danger is that 30 although some rules need to be updated to protect consumers from harm, incumbents will try to destroy competition. People who rent out rooms should pay tax, of course, but they should not be regulated like a Ritz-Carlton hotel. The lighter rules that typically govern 35 bed-and-breakfasts are more than adequate. The sharing economy is the latest example of the internet’s value to consumers. This emerging model is now big and disruptive enough for regulators and companies to have woken up to it. That is a sign of its immense potential. It 40 is time to start caring about sharing.



Which action would best address a concern about the sharing economy discussed in the passage?

- A) Prohibiting established businesses from competing with casual sellers.
- B) Imposing stricter regulations on individual room rentals.
- C) Establishing clear tax guidelines for services in the sharing economy.
- D) Informing buyers more thoroughly about their consumer rights.

5. Every day you wake up with a slightly less connected brain than the night before. New research in mice reveals that during sleep the connections between brain cells, which hold information learned throughout the 5 day, undergo massive shrinkage. The process makes room for learning new memories while shedding weak ones. As author Marie Kondo would put it, this is the brain's very own "life-changing magic of tidying up."
- "When we are awake, learning and adapting to the 10 environment, synapses—or the connections between neurons—get strengthened and grow," says neuroscientist Chiara Cirelli of the University of Wisconsin–Madison. "But you can't keep growing the synapses. At some point, you will saturate them."
- 15 After more than a decade of study, Cirelli and her colleagues have finally found direct evidence that synapses reset at night. They reported their findings in *Science*. Using electron microscopy to look at thousands of ultrathin brain slices taken from awake and sleeping 20 mice, they found that after sleep, the size of most synapses—specifically, the surface area where two neurons touch each other—shrank by about 18 percent.

Although the findings were in mice, Cirelli suspects this synaptic resetting also occurs in people. Indirect 25 evidence, for example, from electrophysiological recordings of the human brain before and after sleep, is consistent with this idea, she says.

This shrinkage appears to spare important memories. About 20 percent of synapses, which were the largest 30 and may hold well-established memories, did not shrink. Less important memories may not get entirely axed but merely pared down—although each synapse shrinks, the overall pattern of connections that constitute a memory remains.

1

Which of the following hypothetical findings would support the hypothesis that synaptic resetting occurs in humans?

- A) An increase in the space where neurons meet in the evening.
- B) A reduction in the space where neurons meet in the evening.
- C) An increase in the space where neurons meet early in the morning.
- D) A reduction in the space where neurons meet early in the morning.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 9-11 ("When we...grow")
- B) Lines 20-22 ("they found...percent")
- C) Lines 29-30 ("About...shrink")
- D) Lines 32-34 ("although...remains")

6. The public has been worried about the safety of genetically modified (GM) foods since scientists at the University of Washington developed the first genetically modified tobacco plants in the 1970s. In the 5 mid-1990s, when the first GM crops reached the market, Greenpeace, the Sierra Club, Ralph Nader, Prince Charles and a number of celebrity chefs took highly visible stands against them. Consumers in Europe became particularly alarmed: a survey 10 conducted in 1997, for example, found that 69 percent of the Austrian public saw serious risks in GM foods, compared with only 14 percent of Americans.

But as medical researchers know, nothing can really be “proved safe.” One can only fail to turn up 15 significant risk after trying hard to find it—as is the case with GM crops.

Although it might seem creepy to add virus DNA to a plant, doing so is, in fact, no big deal, proponents say. Viruses have been inserting their DNA into the 20 genomes of crops, as well as humans and all other organisms, for millions of years. They often deliver the genes of other species while they are at it, which is why our own genome is loaded with genetic sequences that originated in viruses and nonhuman species.

25 Could eating plants with altered genes allow new DNA to work its way into our own? It is theoretically possible but hugely improbable. Scientists have never found genetic material that could survive a trip through the human gut and make it into cells. Besides, we are 30 routinely exposed to—we even consume—the viruses and bacteria whose genes end up in GM foods. The bacterium *B. thuringiensis*, for example, which produces proteins fatal to insects, is sometimes enlisted as a natural pesticide in organic farming.

35 In any case, people have consumed as many as trillions of meals containing genetically modified ingredients over the past few decades. Not a single verified case of illness has ever been attributed to the genetic alterations.

40 Critics often disparage U.S. research on the safety of genetically modified foods, which is often funded or even conducted by GM companies, such as Monsanto. But much research on the subject comes from the 45 European Commission, the administrative body of the E.U., which cannot be so easily dismissed as an industry tool. The European Commission has funded 130 research projects, carried out by more than 500 independent teams, on the safety of GM crops. None of those studies found any special risks from GM crops.

1

Based on the passage, a study of GM food safety conducted by which of the following would be most likely to reassure critics?

- A) A group of researchers who are not affiliated with the agricultural industry.
- B) A private institute whose clients also include producers of GM foods.
- C) A food corporation that wants to expand its distribution of GM foods.
- D) A pharmaceutical company that produces medications derived from GM plants.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 9-11 (“a survey...foods”)
- B) Lines 19-21 (“Viruses...years”)
- C) Lines 35-39 (“In any...alterations”)
- D) Lines 46-48 (“The European...crops”)

7. This passage is adapted from Sharon Tregaskis, "What Bees Tell Us About Global Climate Change," © 2010 by Johns Hopkins Magazine.

Standing in the apiary on the grounds of the U.S. Department of Agriculture's Bee Research Laboratory in Beltsville, Maryland, Wayne Esaias digs through the canvas shoulder bag leaning against his leg in search of 5 the cable he uses to download data. It's dusk as he runs the cord from his laptop—precariously perched on the beam of a cast-iron platform scale—to a small, battery-operated data logger attached to the spring inside the scale's steel column. In the 1800s, a scale like this 10 would have weighed sacks of grain or crates of apples, peaches, and melons. Since arriving at the USDA's bee lab in January 2007, this scale has been loaded with a single item: a colony of *Apis mellifera*, the fuzzy, black-and-yellow honey bee. An attached, 12-bit 15 recorder captures the hive's weight to within a 10th of a pound, along with a daily register of relative ambient humidity and temperature.

On this late January afternoon, during a comparatively balmy respite between the blizzards that 20 dumped several feet of snow on the Middle Atlantic states, the bees, their honey, and the wooden boxes in which they live weigh 94.5 pounds. In mid-July, as last year's unusually long nectar flow finally ebbed, the whole contraption topped out at 275 pounds, including 25 nearly 150 pounds of honey. "Right now, the colony is in a cluster about the size of a soccer ball," says Esaias, who's kept bees for nearly two decades and knows without lifting the lid what's going on inside this hive. "The center of the cluster is where the queen is, and 30 they're keeping her at 93 degrees—the rest are just hanging there, tensing their flight muscles to generate heat." Provided that they have enough calories to fuel their winter workout, a healthy colony can survive as far north as Anchorage, Alaska. "They slowly eat their 35 way up through the winter," he says. "It's a race: Will they eat all their honey before the nectar flows, or not?" To make sure their charges win that race, apiarists have long relied on scale hives for vital management clues. By tracking daily weight variations, a beekeeper can 40 discern when the colony needs a nutritional boost to carry it through lean times, whether to add extra combs for honey storage and even detect incursions by marauding robber bees—all without disturbing the colony. A graph of the hive's weight—which can

45 increase by as much as 35 pounds a day in some parts of the United States during peak nectar flow—reveals the date on which the bees' foraging was was most productive and provides a direct record of successful pollination. "Around here, the bees make 50 their living in the month of May," says Esaias, noting that his bees often achieve daily spikes of 25 pounds, the maximum in Maryland. "There's almost no nectar coming in for the rest of the year." A scientist by training and career oceanographer at NASA, Esaias 55 established the Mink Hollow Apiary in his Highland, Maryland, backyard in 1992 with a trio of hand-me-down hives and an antique platform scale much like the one at the Beltsville bee lab. Ever since, he's maintained a meticulous record of the bees' daily 60 weight, as well as weather patterns and such details as his efforts to keep them healthy. In late 2006, honey bees nationwide began disappearing in an ongoing syndrome dubbed colony collapse disorder (CCD). Entire hives went empty as bees inexplicably 65 abandoned their young and their honey. Commercial beekeepers reported losses up to 90 percent, and the large-scale farmers who rely on honey bees to ensure rich harvests of almonds, apples, and sunflowers became very, very nervous. Looking for clues, Esaias 70 turned to his own records. While the resulting graphs threw no light on the cause of CCD, a staggering trend emerged: In the span of just 15 seasons, the date on which his Mink Hollow bees brought home the most nectar had shifted by two weeks—from late May 75 to the middle of the month. "I was shocked when I plotted this up," he says. "It was right under my nose, going on the whole time." The epiphany would lead Esaias to launch a series of research collaborations, featuring honey bees and other pollinators, to 80 investigate the relationships among plants, pollinators, and weather patterns. Already, the work has begun to reveal insights into the often unintended consequences of human interventions in natural and agricultural ecosystems, and exposed significant 85 gaps in how we understand the effect climate change will have on everything from food production to terrestrial ecology.

1

Based on the passage, to which of the following hypothetical outcomes would research into the bees' disappearance most likely lead?

- A) The cultivation of hybrid fruits and vegetables.
- B) Larger-scale production of the most profitable crops.
- C) More sophisticated tools for studying insect behavior.
- D) A heightened awareness of how shifts in the climate impact crop growth.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 58-61 ("Ever...healthy")
- B) Lines 65-69 ("Commercial...nervous")
- C) Lines 72-74 ("In...weeks")
- D) Lines 81-87 ("Already...ecology")

## Functions of Key Words and Punctuation

<b>Continuers</b>	<b>Contradictors</b>
<b>Continue</b>	<b>Speculate</b>
Additionally Also And As well as Finally First Furthermore In addition Moreover Next Then	Could If It is possible May Maybe Might Perhaps
<b>Illustrate, Support</b>	<b>Call attention to Underscore, Highlight Emphasize</b>
For example For instance One reason/ another reason	Indeed In fact Let me be clear
<b>Explain</b>	<b>Indicate Importance</b>
Because Explanation That is The answer is The reason is Colon Dash	Capital letters Exclamation point Italics Repetition (of a word, phrase)
<b>Define</b>	<b>Draw a conclusion</b>
That is (to say) Properly speaking Colon Dash Parentheses	Key Significant The point/ goal is As a result Consequently
<b>Compare</b>	<b>Hence</b>
As Just as Like(wise) Much as Similarly	So Thereby Therefore Thus
	<b>Qualify</b>
	Dashes Parentheses

## Common Function Words and Phrases

<b>Positive</b>	<b>Negative</b>	<b>Neutral</b>
<b>Support</b>	<b>Refute</b>	<b>Describe</b>
Advance (a claim)	Attack*	Characterize
Affirm	Challenge	Convey
Bolster	Condemn*	Depict
Claim	Contradict	Discuss
Defend	Criticize	Dramatize
Exemplify	Debate	Evoke
Illustrate	Decry	Portray
Prove*	Deny	Present
Provide (evidence)	Discredit*	Represent
Offer (an example)	Dismiss	Show
Substantiate	Dispel	Trace
<b>Praise</b>	Imply skepticism	<b>Indicate</b>
Celebrate	Question	Identify
<b>Acknowledge</b>	Undermine*	Point out
	<b>Warn</b>	Reveal
<b>Propose</b>	Raise concern	<b>Introduce</b>
Imply	Make fun of	<b>Shift</b>
Suggest	Mock*	Change
<b>Emphasize</b>	Satirize	Digress*
Call attention to	Scoff at*	<b>Restate</b>
Focus on		Paraphrase
Highlight	<b>Concede</b>	Summarize
Reinforce	Acknowledge	
Reiterate	Recognize	<b>Hypothesize</b>
Underscore		
<b>Explain</b>	<b>Exaggerate</b>	Speculate
Account for	<b>Downplay</b>	<b>Analyze</b>
Articulate	Minimize*	Consider
Clarify	<b>Lament*</b>	Describe
Define	Bemoan*	Develop
Explicate		Explore
Justify*		Reflect on
Qualify		
Specify		
<b>Persuade</b>		<b>Attribute</b>
Advocate		Cite
Encourage		Allude to
Promote		

\*Signals an answer that is likely to be incorrect.

For a glossary of selected terms, see p. 230.

## Reading for Function Exercises

1. To understand what the new software—that is, analytics—can do that's different from more familiar software like spreadsheets, word processing, and graphics, consider the lowly photograph. Here the relevant facts aren't how many bytes constitute a digital photograph, or a billion of them. That's about as instructive as counting the silver halide molecules used to form a single old-fashioned print photo. The important feature of a digital image's bytes is that, unlike crystalline molecules, they are uniquely easy to store, transport, and manipulate with software. In the first era of digital images, people were fascinated by the convenience and malleability (think PhotoShop) of capturing, storing, and sharing pictures. Now, instead of using software to manage photos, we can mine features of the bytes that make up the digital image. Facebook can, without privacy invasion, track where and when, for example, vacationing is trending, since digital images reveal at least that much. But more importantly, those data can be cross-correlated, even in real time, with seemingly unrelated data such as local weather, interest rates, crime figures, and so on. Such correlations associated with just one photograph aren't revealing. But imagine looking at billions of photos over weeks, months, years, then correlating them with dozens of directly related data sets (vacation bookings, air traffic), tangential information (weather, interest rates, unemployment), or orthogonal information (social or political trends). With essentially free super-computing, we can mine and usefully associate massive, formerly unrelated data sets and unveil all manner of economic, cultural, and social realities.

For science fiction aficionados, Isaac Asimov anticipated the idea of using massive data sets to predict human behavior, coining it “psychohistory” in his 1951 Foundation trilogy. The bigger the data set, Asimov said then, the more predictable the future. With big-data analytics, one can finally see the forest, instead of just the capillaries in the tree leaves. Or to put it in more accurate terms, one can see beyond the apparently random motion of a few thousand molecules of air inside a balloon; one can see the balloon itself, and beyond that, that it is inflating, that it is yellow, and that it is part of a bunch of balloons en route to a birthday party. The data/software world has, until now, been largely about looking at the molecules inside one balloon.

1

The reference to “capturing, storing, and sharing pictures” (line 14) primarily serves to

- A) underscore a key difference between old and new technologies.
- B) point out technological features that were once considered novel.
- C) describe how digital images are preserved.
- D) emphasize the rapid nature of technological change.

2

The references to local weather, interest rates, and crime figures (lines 21-22) primarily serve to

- A) provide examples of disparate subjects that may have hidden connections.
- B) emphasize the range of topics covered on news websites.
- C) point out local issues that may be of broader interest.
- D) call attention to the limits of data analysis.

3

The passage’s discussion of Isaac Asimov primarily serves to

- A) introduce the concept of science fiction.
- B) call attention to an individual who foresaw recent developments.
- C) describe the influence of science fiction fans on technological discoveries.
- D) emphasize the differences between science fiction and science.

2. The following passage is adapted from a novel by Willa Cather, originally published in 1918. The protagonist has been sent to live with his grandparents in Nebraska.

All the years that have passed have not dimmed my memory of that first glorious autumn. The new country lay open before me: there were no fences in those days, and I could choose my own way over the grass uplands, 5 trusting the pony to get me home again. Sometimes I followed the sunflower-bordered roads.

I used to love to drift along the pale-yellow cornfields, looking for the damp spots one sometimes found at their edges, where the smartweed soon turned a rich copper 10 color and the narrow brown leaves hung curled like cocoons about the swollen joints of the stem. Sometimes I went south to visit our German neighbors and to admire their catalpa grove, or to see the big elm tree that grew up out of a deep crack in the earth and had a 15 hawk's nest in its branches. Trees were so rare in that country, and they had to make such a hard fight to grow, that we used to feel anxious about them, and visit them as if they were persons. It must have been the scarcity of 20 detail in that tawny landscape that made detail so precious.

Sometimes I rode north to the big prairie-dog town to watch the brown earth-owls fly home in the late afternoon and go down to their nests underground with the dogs.

Antonia Shimerda liked to go with me, and we used to 25 wonder a great deal about these birds of subterranean habit. We had to be on our guard there, for rattlesnakes were always lurking about. They came to pick up an easy living among the dogs and owls, which were quite defenseless against them; took possession of their 30 comfortable houses and ate the eggs and puppies. We felt sorry for the owls. It was always mournful to see them come flying home at sunset and disappear under the earth.

But, after all, we felt, winged things who would live 35 like that must be rather degraded creatures. The dog-town was a long way from any pond or creek. Otto Fuchs said he had seen populous dog-towns in the desert where there was no surface water for fifty miles; he insisted that some of the holes must go down to water—nearly two 40 hundred feet, hereabouts. Antonia said she didn't believe it; that the dogs probably lapped up the dew in the early morning, like the rabbits.

Antonia had opinions about everything, and she was soon able to make them known. Almost every day she 45 came running across the prairie to have her reading lesson with me. Mrs. Shimerda grumbled, but realized it was important that one member of the family should learn English. When the lesson was over, we used to go up to the watermelon patch behind the garden. I split the 50 melons with an old corn-knife, and we lifted out the hearts and ate them with the juice trickling through our fingers. The white melons we did not touch, but we watched them with curiosity. They were to be picked later, when the hard frosts had set in, and put away for 55 winter use. After weeks on the ocean, the Shimerdas were famished for fruit. The two girls would wander for miles along the edge of the cornfields, hunting for ground-cherries.

Antonia loved to help grandmother in the kitchen 60 and to learn about cooking and housekeeping. She would stand beside her, watching her every movement. We were willing to believe that Mrs. Shimerda was a good housewife in her own country, but she managed poorly under new conditions. I remember how horrified 65 we were at the sour, ashy-grey bread she gave her family to eat. She mixed her dough, we discovered, in an old tin peck-measure that had been used about the barn. When she took the paste out to bake it, she left smears of dough sticking to the sides of the measure, put 70 the measure on the shelf behind the stove, and let this residue ferment. The next time she made bread, she scraped this sour stuff down into the fresh dough to serve as yeast.

The reference to the catalpa grove and the elm tree (line 13) primarily serves to

- A) illustrate the narrator's love of nature.
- B) call attention to the diversity of the natural world.
- C) emphasize the barrenness of the landscape.
- D) explain why the narrator felt anxious about his new life.

2

The narrator's reference to ground-cherries  
(line 58) primarily serves to

- A) emphasize the wholesome quality of the Shimerdas' new life.
- B) demonstrate the difficulty of finding food in the narrator's new home.
- C) describe a food that the narrator was desperate to eat.
- D) suggest the limited range of foods to which the Shimerdas previously had access.

3

The narrator's statement that Mrs. Shimerda "was a good housewife in her own country" (lines 62-63) primarily serves to

- A) highlight a contrast.
- B) criticize an injustice.
- C) defend a decision.
- D) explain a reaction.

3. The following passage is adapted from "Makerspaces, Hackerspaces, and Community Scale Production in Detroit and Beyond," © 2013 by Sean Ansanelli.

During the mid-1980s, spaces began to emerge across Europe where computer hackers could convene for mutual support and camaraderie. In the past few years, the idea of fostering such shared, physical spaces has been rapidly adapted by the diverse and growing community of "makers," who seek to apply the idea of "hacking" to physical objects, processes, or anything else that can be deciphered and improved upon.

A hackerspace is described by hackerspaces.org as a "community-operated physical space where people with common interests, often in computers, technology, science, digital art or electronic art, can meet, socialize, and/or collaborate." Such spaces can vary in size, available technology, and membership structure (some being completely open), but generally share community-oriented characteristics. Indeed, while the term "hacker" can sometimes have negative connotations, modern hackerspaces thrive off of community, openness, and assimilating diverse viewpoints – these often being the only guiding principles in otherwise informal organizational structures.

In recent years, the city of Detroit has emerged as a hotbed for hackerspaces and other DIY ("Do-It-Yourself") experiments. Several hackerspaces can already be found throughout the city and several more are currently in formation. Of course, Detroit's attractiveness for such projects can be partially attributed to cheap real estate, which allows aspiring hackers to acquire ample space for experimentation. Some observers have also described this kind of making and tinkering as embedded in the DNA of Detroit's residents, who are able to harness substantial intergenerational knowledge and attract like-minded individuals.

Hackerspaces (or "makerspaces") can be found in more commercial forms, but the vast majority of spaces are self-organized and not-for-profit. For example, the OmniCorp hackerspace operates off member fees to cover rent and new equipment, from laser cutters to welding tools. OmniCorp also hosts an "open hack night" every Thursday in which the space is open to the general public. Potential members are required to attend at least one open hack night prior to a consensus vote by the existing members for admittance; no prospective members have yet been denied.

A visit to one of OmniCorp's open hack nights reveals the vast variety of activity and energy existing

in the space. In the main common room alone, activities range from experimenting with sound installations and learning to program Arduino boards to building speculative "oloid" shapes – all just for the sake of it. With a general atmosphere of mutual support, participants in the space are continually encouraged to help others.

55 One of the most active community-focused initiatives in the city is the Mt. Elliot Makerspace. Jeff Sturges, former MIT Media Lab Fellow and Co-Founder of OmniCorp, started the Mt. Elliot project with the aim of replicating MIT's Fab Lab model on a smaller, cheaper scale in Detroit. "Fab Labs" are production facilities that consist of a small collection of flexible computer-controlled tools that cover several different scales and various materials, with the aim to make "almost anything" (including other machines). The Mt. Elliot 60 Makerspace now offers youth-based skill development programs in eight areas: Transportation, Electronics, Digital Tools, Wearables, Design and Fabrication, Food, Music, and Arts. The range of activities is meant to provide not only something for everyone, but a well-rounded base knowledge of making to all participants.

While the center receives some foundational support, the space also derives significant support from the local community. Makerspaces throughout the city connect the space's youth-based programming directly to 70 school curriculums.

The growing interest in and development of hacker/makerspaces has been explained, in part, as a result of the growing maker movement. Through the combination of cultural norms and communication 80 channels from open source production as well as increasingly available technologies for physical production, amateur maker communities have developed in virtual and physical spaces.

Publications such as *Wired* are noticing the 85 transformative potential of this emerging movement and have sought to devote significant attention to its development. Chief editor Chris Anderson recently published a book entitled *Makers*, in which he proclaims that the movement will become the next Industrial 90 Revolution. Anderson argues such developments will allow for a new wave of business opportunities by providing mass-customization rather than mass-production.

The transformative potential of these trends goes 95 beyond new business opportunities or competitive advantages for economic growth. Rather, these trends demonstrate the potential to actually transform economic development models entirely.

1

The passage's discussion of Europe in the 1980s primarily serves to

- A) introduce the concept of hackerspaces.
- B) call attention to Detroit's unique role in the hackerspace movement.
- C) compare hackerspaces in the United States to foreign hackerspaces.
- D) provide a description of a place where hackerspaces have been particularly popular.

2

The author's statement that "the term 'hacker' can sometimes have negative connotations" (lines 16-17) serves to

- A) criticize a movement.
- B) anticipate a potential criticism.
- C) contrast past and present forms of technology.
- D) emphasize the exclusive nature of an organization.

3

The primary function of the third paragraph (lines 22-34) is to

- A) point out that the decline of certain industries can have unexpected benefits.
- B) explain why hackerspaces have succeeded in some cities and failed in others.
- C) indicate some of the reasons that hackerspaces have flourished in a particular city.
- D) demonstrate the effects of geography on the economy.

4

The passage's discussion of OmniCorp (line 38) primarily serves to

- A) call attention to hackerspaces' urgent need for funds.
- B) suggest that money should not play a role in creative enterprises.
- C) point out that non-profit hackerspaces are typically more successful than for-profit ones.
- D) emphasize that hackerspaces are open and flexible organizations.

5

The references to *Wired* magazine and Chris Anderson primarily serve to

- A) describe a key figure in the maker movement.
- B) underscore the economic power of the maker movement.
- C) trace the influence of the Industrial Revolution on the maker movement.
- D) suggest that mass-production is incompatible with the modern economy.

4. This passage is from Barbara Jordan's keynote address at the 1976 Democratic National Convention. A Texas native, Jordan was the first African-American woman to represent the Deep South in Congress.

It was one hundred and forty-four years ago that members of the Democratic Party first met in convention to select a Presidential candidate. A lot of years passed since 1832, and during that time it would have been most unusual for any national political party to ask a Barbara Jordan to deliver a keynote address. But tonight, here I am. And I feel that notwithstanding the past that my presence here is one additional bit of evidence that the American Dream need not forever be deferred.

Now that I have this grand distinction, what in the world am I supposed to say? I could list the problems which cause people to feel cynical, angry, frustrated; problems which include lack of integrity in government; the feeling that the individual no longer counts; feeling that the grand American experiment is failing or has failed. I could recite these problems, and then I could sit down and offer no solutions. But I don't choose to do that either. The citizens of America expect more.

20 We are a people in search of a national community. We are a people trying not only to solve the problems of the present, unemployment, inflation, but we are attempting on a larger scale to fulfill the promise of America. We are attempting to fulfill our national purpose, 25 to create and sustain a society in which all of us are equal.

And now we must look to the future. Let us heed the voice of the people and recognize their common sense. If we do not, we not only blaspheme our political heritage, we ignore the common ties that bind all 30 Americans. Many fear the future. Many are distrustful of their leaders, and believe that their voices are never heard. Many seek only to satisfy their private interests. But this is the great danger America faces – that we will cease to be one nation and become instead a collection 35 of interest groups: city against suburb, region against region, individual against individual; each seeking to satisfy private wants. If that happens, who then will speak for America? Who then will speak for the common good?

This is the question which must be answered in 1976: 40 Are we to be one people bound together by common spirit, sharing in a common endeavor; or will we become a divided nation? For all of its uncertainty, we cannot flee the future. We must address and master the future together. It can be done if we restore the belief that we 45 share a sense of national community, that we share a common national endeavor.

There is no executive order; there is no law that can require the American people to form a national community. This we must do as individuals, and if we 50 do it as individuals, there is no President of the United States who can veto that decision.

As a first step, we must restore our belief in ourselves. We are a generous people, so why can't we be generous with each other?  
55 And now, what are those of us who are elected public officials supposed to do? We call ourselves "public servants" but I'll tell you this: We as public servants must set an example for the rest of the nation. It is hypocritical for the public official to admonish and 60 exhort the people to uphold the common good if we are derelict in upholding the common good. More is required of public officials than slogans and handshakes and press releases.

If we promise as public officials, we must deliver.  
65 If we as public officials propose, we must produce. If we say to the American people, "It is time for you to be sacrificial" – sacrifice. And again, if we make mistakes, we must be willing to admit them. What we have to do is strike a balance between the idea that 70 government should do everything and the idea that government ought to do nothing.

Let there be no illusions about the difficulty of forming this kind of a national community. It's tough, difficult, not easy. But a spirit of harmony will survive 75 in America only if each of us remembers, when self-interest and bitterness seem to prevail, that we share a common destiny.

We cannot improve on the system of government handed down to us by the founders of the Republic.  
80 There is no way to improve upon that. But what we can do is to find new ways to implement that system and realize our destiny.

1

The passage's discussion of problems facing the American people (lines 12-17) primarily serves to

- A) demonstrate the importance of a national community.
- B) indicate some attitudes that the author rejects.
- C) explain that Americans are justified in fearing the future.
- D) emphasize the importance of local communities.

2

The author's discussion of fear and distrust in lines 30-32 primarily serves to

- A) call attention to the central role of confidence in effective leadership.
- B) emphasize the importance of strong regional identities.
- C) point out some factors that pose a threat to national cohesion.
- D) demonstrate the necessity of electing powerful representatives.

3

The reference to interest groups in line 35 primarily serves to

- A) defend an action.
- B) call attention to a risk.
- C) describe an unlikely scenario.
- D) propose a course of action.

4

Jordan's reference to the future in line 43 serves to

- A) refute a widely accepted claim.
- B) justify a controversial belief.
- C) propose a novel alternative.
- D) point out an inevitable occurrence.

5

The function of the quotation marks in lines 55-57 is to

- A) indicate some unexpected tasks associated with public office.
- B) suggest that certain politicians are not living up to their responsibilities.
- C) praise politicians for their commitment to civic life.
- D) implore the American people to consider the common good.

6

The reference to "slogans and handshakes and press releases" (lines 62-63) primarily serves to

- A) point out superficial actions that fail to address underlying problems.
- B) call attention to the public aspect of political office.
- C) suggest that politicians should increase their interactions with constituents.
- D) emphasize the importance of collaboration between politicians and citizens.

5. The following passage is adapted from Julian Jackson, "New Research Suggests Dinosaurs Were Warm-Blooded and Active" © 2011 by Julian Jackson.

New research from the University of Adelaide has added to the debate about whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Professor Roger Seymour from the University's School of Earth & Environmental Sciences has applied the latest theories of human and animal anatomy and physiology to provide insight into the lives of dinosaurs.

Human thigh bones have tiny holes – known as the "nutrient foramen" – on the shaft that supply blood to living bone cells inside. New research has shown that the size of those holes is related to the maximum rate that a person can be active during aerobic exercise. Professor Seymour has used this principle to evaluate the activity levels of dinosaurs.

"Far from being lifeless, bone cells have a relatively high metabolic rate and they therefore require a large blood supply to deliver oxygen. On the inside of the bone, the blood supply comes usually from a single artery and vein that pass through a hole on the shaft – the nutrient foramen," he says.

Professor Seymour wondered whether the size of the nutrient foramen might indicate how much blood was necessary to keep the bones in good repair. For example, highly active animals might cause more bone 'microfractures,' requiring more frequent repairs by the bone cells and therefore a greater blood supply. "My aim was to see whether we could use fossil bones of dinosaurs to indicate the level of bone metabolic rate and possibly extend it to the whole body's metabolic rate," he says. "One of the big controversies among paleobiologists is whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Could the size of the foramen be a possible gauge for dinosaur metabolic rate?"

Comparisons were made with the sizes of the holes in living mammals and reptiles, and their metabolic rates. Measuring mammals ranging from mice to elephants, and reptiles from lizards to crocodiles, one of Professor Seymour's Honors students, Sarah Smith, combed the collections of Australian museums, photographing and measuring hundreds of tiny holes in thigh bones.

"The results were unequivocal. The sizes of the holes were related closely to the maximum metabolic rates during peak movement in mammals and reptiles," Professor Seymour says. "The holes found in mammals were about 10 times larger than those in reptiles."

These holes were compared to those of fossil dinosaurs. Dr. Don Henderson, Curator of Dinosaurs from the Royal Tyrrell Museum in Alberta, Canada, and Daniela Schwarz-Wings from the Museum für Naturkunde Humboldt University Berlin, Germany measured the holes in 10 species of dinosaurs from five different groups, including bipedal and quadrupedal carnivores and herbivores, weighing 50kg to 20,000kg.

"On a relative comparison to eliminate the differences in body size, all of the dinosaurs had holes in their thigh bones larger than those of mammals," Professor Seymour says.

"The dinosaurs appeared to be even more active than the mammals. We certainly didn't expect to see that. These results provide additional weight to theories that dinosaurs were warm-blooded and highly active creatures, rather than cold-blooded and sluggish."

Professor Seymour says following the results of this study, it's likely that a simple measurement of foramen size could be used to evaluate maximum activity levels in other vertebrate animals.

1. The reference to the size of the foramen (line 34) primarily serves to

- A) compare the metabolic rates of different dinosaur species.
- B) point out that dinosaurs were able to survive in a range of climates.
- C) indicate a means of resolving a scientific dispute.
- D) suggest that mammals and reptiles were once closer in size than they are today.

2. The statement that the dinosaurs "appeared to be even more active than the mammals" (lines 62-63) serves to

- A) emphasize a conventional belief.
- B) defend a finding.
- C) propose a controversial claim.
- D) call attention to a surprising discovery.

6. The following passage is adapted from "Scientists Discover Salty Aquifer, Previously Unknown Microbial Habitat Under Antarctica," © 2015 by Dartmouth College.

Using an airborne imaging system for the first time in Antarctica, scientists have discovered a vast network of unfrozen salty groundwater that may support previously unknown microbial life deep under the coldest, driest 5 desert on our planet. The findings shed new light on ancient climate change on Earth and provide strong evidence that a similar briny aquifer could support microscopic life on Mars. The scientists used SkyTEM, an airborne electromagnetic sensor, to detect and map 10 otherwise inaccessible subterranean features.

The system uses an antennae suspended beneath a helicopter to create a magnetic field that reveals the subsurface to a depth of about 1,000 feet. Because a helicopter was used, large areas of rugged terrain could 15 be surveyed. The SkyTEM team was funded by the National Science Foundation and led by researchers from the University of Tennessee, Knoxville (UTK), and Dartmouth College, which oversees the NSF's SkyTEM project.

20 "These unfrozen materials appear to be relics of past surface ecosystems and our findings provide compelling evidence that they now provide deep subsurface habitats for microbial life despite extreme environmental conditions," says lead author Jill Mikucki, 25 an assistant professor at UTK. "These new below-ground visualization technologies can also provide insight on glacial dynamics and how Antarctica responds to climate change."

Co-author Dartmouth Professor Ross Virginia is 30 SkyTEM's co-principal investigator and director of Dartmouth's Institute of Arctic Studies. "This project is studying the past and present climate to, in part, understand how climate change in the future will affect biodiversity and ecosystem processes," Virginia says. 35 "This fantastic new view beneath the surface will help us sort out competing ideas about how the McMurdo Dry Valleys have changed with time and how this history influences what we see today."

The researchers found that the unfrozen brines form 40 extensive, interconnected aquifers deep beneath glaciers and lakes and within permanently frozen soils. The brines extend from the coast to at least 7.5 miles inland in the McMurdo Dry Valleys, the largest ice-free region in Antarctica. The brines could be due to freezing and/or 45 deposits. The findings show for the first time that the Dry Valleys' lakes are interconnected rather than isolated; connectivity between lakes and aquifers is important in sustaining ecosystems through drastic climate change, such as lake dry-down events. The findings also challenge

50 the assumption that parts of the ice sheets below the pressure melting point are devoid of liquid water. In addition to providing answers about the biological adaptations of previously unknown ecosystems that persist in the extreme cold and dark of the Antarctic 55 winter, the new study could help scientists to understand whether similar conditions might exist elsewhere in the solar system, specifically beneath the surface of Mars, which has many similarities to the Dry Valleys. Overall, the Dry Valleys ecosystem – 60 cold, vegetation-free and home only to microscopic animal and plant life – resembles, during the Antarctic summer, conditions on the surface on Mars.

SkyTEM produced images of Taylor Valley along the Ross Sea that suggest briny sediments exist at 65 subsurface temperatures down to perhaps -68°F, which is considered suitable for microbial life. One of the studied areas was lower Taylor Glacier, where the data suggest ancient brine still exists beneath the glacier. That conclusion is supported by the presence 70 of Blood Falls, an iron-rich brine that seeps out of the glacier and hosts an active microbial ecosystem.

Scientists' understanding of Antarctica's underground environment is changing dramatically as research reveals that subglacial lakes are widespread 75 and that at least half of the areas covered by the ice sheet are akin to wetlands on other continents. But groundwater in the ice-free regions and along the coastal margins remains poorly understood.

#### 11

The reference to brines in line 44 primarily serves to

- A) offer an explanation.
- B) point out a misconception.
- C) refute a hypothesis.
- D) define a term.

2

In context of the passage, the function of the sixth paragraph (lines 52-62) is to

- A) describe some characteristics of Antarctic ecosystems not found elsewhere on earth.
- B) compare the development of ecosystems in Antarctica to the development of ecosystems on Mars.
- C) indicate a possible outcome of the SkyTEM research in Antarctica.
- D) explain how microscopic plants and animals survive in extreme conditions.

3

The reference to microscopic animal and plant life (lines 60-61) primarily serves to

- A) emphasize the harshness of the Antarctic climate.
- B) describe the effects of iron on microbial life.
- C) indicate the importance of research on glaciers.
- D) compare an environment on Earth to an environment on another planet.

## Common Tone and Attitude Words

	<b>Positive</b>	<b>Negative</b>	<b>Neutral</b>
<b>Moderate</b>	Agreement Appreciative Approving Confident Informal Proud Sympathetic	Ambivalent Critical Disagreement Doubtful Skeptical Tentative Uncertain	Analytical Informative Neutral Objective Personal
<b>Extreme</b>	Amused Awed/Awestruck Excited Humorous	Angry Dissainful Fearful Furious Hostile Jeering Mocking Melodramatic Sarcastic	Academic Apathetic Indifferent Resigned

## Tone and Attitude Exercises

1. Citrus greening, the plague that could wipe out Florida's \$9 billion orange industry, begins with the touch of a jumpy brown bug on a sun-kissed leaf. From there, the bacterial disease incubates in the tree's roots, then moves back up the trunk in full force, causing nutrient flows to seize up. Leaves turn yellow, and the oranges, deprived of sugars from the leaves, remain green, sour, and hard. Many fall before harvest, brown necrotic flesh ringing failed stems.
- 10 For the past decade, Florida's oranges have been literally starving. Since it first appeared in 2005, citrus greening, also known by its Chinese name, huanglongbing, has swept across Florida's groves like a flood. With no hills to block it, the Asian citrus psyllid—the invasive aphid relative that carries the disease—has infected nearly every orchard in the state. By one estimate, 80 percent of Florida's citrus trees are infected and declining.
- 15 20 The disease has spread beyond Florida to nearly every orange-growing region in the United States.

Despite many generations of breeding by humanity, no citrus plant resists greening; it afflicts lemons, grapefruits, and other citrus species as well. Once a tree is infected, it will die. Yet in a few select Floridian orchards, there are now trees that, thanks to innovative technology, can fight the greening tide.

1

The use of the phrases "jumpy brown bug" and "sun-kissed leaf" in the first sentence establishes a tone that is

- A) critical.
- B) mocking.
- C) informal.
- D) detached.

2. Chimps do it, birds do it, even you and I do it. Once you see someone yawn, you are compelled to do the same. Now it seems that wolves can be added to the list of animals known to spread yawns like a contagion.

Among humans, even thinking about yawning can trigger the reflex, leading some to suspect that catching a yawn is linked to our ability to empathize with other humans. For instance, contagious yawning activates the same parts of the brain that govern empathy and social know-how. And some studies have shown that humans with more fine-tuned social skills are more likely to catch a yawn.

Similarly, chimpanzees, baboons and bonobos often yawn when they see other members of their species yawning. Chimps (*Pan troglodytes*) can catch yawns from humans, even virtual ones. At least in primates, contagious yawning seems to require an emotional connection and may function as a demonstration of empathy. Beyond primates, though, the trends are less clear-cut. One study found evidence of contagious yawning in birds but didn't connect it to empathy. A 2008 study showed that dogs (*Canis lupus familiaris*) could catch yawns from humans, and another showed that dogs were more likely to catch the yawn of a

familiar human rather than a stranger. But efforts to see if dogs catch yawns from each other and to replicate the results with humans have so far had no luck.

1

The author's attitude toward the possibility that yawning is a sign of empathy in non-primates is best described as one of

- A) skepticism.
- B) enthusiasm.
- C) approval.
- D) hostility.

2

Which lines provide the best evidence for the answer to the previous question?

- A) Lines 2-3 ("Once...same")
- B) Lines 6-9 ("Among...humans")
- C) Lines 14-16 ("Similarly...yawning")
- D) Lines 26-28 ("But...luck")

3. These are stimulating times for anyone interested in questions of animal consciousness. On what seems like a monthly basis, scientific teams announce the results of new experiments, adding to a preponderance  
5 of evidence that we've been underestimating animal minds, even those of us who have rated them fairly highly. New animal behaviors and capacities are observed in the wild, often involving tool use—or at least object manipulation—the very kinds of activity  
10 that led the distinguished zoologist Donald R. Griffin to found the field of cognitive ethology (animal thinking) in 1978: octopuses piling stones in front of their hideyholes, to name one recent example; or dolphins fitting marine sponges to their beaks in order to dig for  
15 food on the seabed; or wasps using small stones to smooth the sand around their egg chambers, concealing them from predators. At the same time neurobiologists have been finding that the physical structures in our own brains most commonly held responsible for  
20 consciousness are not as rare in the animal kingdom as had been assumed. Indeed they are common. All of this work and discovery appeared to reach a kind of

4. Every time a car drives through a major intersection, it becomes a data point. Magnetic coils of wire lie just beneath the pavement, registering each passing car. This starts a cascade of information: Computers tally the  
5 number and speed of cars, shoot the data through underground cables to a command center and finally translate it into the colors red, yellow and green. On the seventh floor of Boston City Hall, the three colors splash like paint across a wall-sized map.  
10 To drivers, the color red means stop, but on the map it tells traffic engineers to leap into action. Traffic control centers like this one—a room cluttered with computer terminals and live video feeds of urban intersections—represent the brain of a traffic system. The city's network  
15 of sensors, cables and signals are the nerves connected to the rest of the body. "Most people don't think there are eyes and ears keeping track of all this stuff," says John DeBenedictis, the center's engineering director. But in reality, engineers literally watch our every move,  
20 making subtle changes that relieve and redirect traffic.

The tactics and aims of traffic management are modest but powerful. Most intersections rely on a combination of pre-set timing and computer adaptation. For example, where a busy main road intersects with

crescendo last summer, when an international group of prominent neuroscientists meeting at the University of Cambridge issued "The Cambridge Declaration on Consciousness in Non-Human Animals," a document stating that "humans are not unique in possessing the neurological substrates that generate consciousness." It goes further to conclude that numerous documented animal behaviors must be considered "consistent with experienced feeling states."

1

The use of the phrases "stimulating times" (line 1), "what seems like a monthly basis" (lines 2-3), and "preponderance of evidence" (lines 4-5) in the first two sentences establishes a tone that is

- A) dubious.
- B) approving.
- C) tentative.
- D) disdainful.

25 a quiet residential street, the traffic signal might give 70 percent of "green time" to the main road, and 30 percent to the residential road. (Green lights last between a few seconds and a couple minutes, and tend to shorten at rush hour to help the traffic move continuously.) But when traffic overwhelms the pre-set timing, engineers override the system and make changes.

1

What effect does the quotation by John DeBenedictis in lines 16-17 have on the tone of the passage?

- A) It creates a skeptical tone, implying that the power of computers to control traffic may be limited.
- B) It creates an enthusiastic tone, emphasizing the power of technology to ensure safety.
- C) It creates an ominous tone, suggesting the risks of unrestrained surveillance.
- D) It creates a conversational tone, pointing out a common misconception in everyday language.

5. To understand what the new software—that is, analytics—can do that's different from more familiar software like spreadsheets, word processing, and graphics, consider the lowly photograph. Here the  
5 relevant facts aren't how many bytes constitute a digital photograph, or a billion of them. That's about as instructive as counting the silver halide molecules used to form a single old-fashioned print photo. The important feature of a digital image's bytes is that, unlike  
10 crystalline molecules, they are uniquely easy to store, transport, and manipulate with software. In the first era of digital images, people were fascinated by the convenience and malleability (think PhotoShop) of capturing, storing, and sharing pictures. Now, instead of  
15 using software to manage photos, we can mine features of the bytes that make up the digital image. Facebook can, without privacy invasion, track where and when, for example, vacationing is trending, since digital images reveal at least that much. But more importantly, those  
20 data can be cross-correlated, even in real time, with seemingly unrelated data such as local weather, interest rates, crime figures, and so on. Such correlations associated with just one photograph aren't revealing. But imagine looking at billions of photos over weeks,  
25 months, years, then correlating them with dozens of directly related data sets (vacation bookings, air traffic), tangential information (weather, interest rates, unemployment), or orthogonal information (social or political trends). With essentially free super-computing,  
30 we can mine and usefully associate massive, formerly unrelated data sets and unveil all manner of economic, cultural, and social realities.

For science fiction aficionados, Isaac Asimov anticipated the idea of using massive data sets to predict  
35 human behavior, coining it “psychohistory” in his 1951 Foundation trilogy. The bigger the data set, Asimov said then, the more predictable the future. With big-data analytics, one can finally see the forest, instead of just the capillaries in the tree leaves. Or to put it in more  
40 accurate terms, one can see beyond the apparently random motion of a few thousand molecules of air inside a balloon; one can see the balloon itself, and beyond that, that it is inflating, that it is yellow, and that it is part of a bunch of balloons en route to a birthday party. The  
45 data/software world has, until now, been largely about looking at the molecules inside one balloon.



What effect does the word “imagine” (line 24) have on the tone of the passage?

- A) It creates a mysterious tone that suggests the unlimited potential of technology.
- B) It creates a skeptical tone that suggests the necessity of resisting certain inventions.
- C) It creates a speculative tone that encourages the reader to consider a scenario.
- D) It creates a defiant tone that emphasizes the need to persevere in the face of adversity.

6. The following passage is adapted from Jane Austen, *Northanger Abbey*, originally published in 1817.

No one who had ever seen Catherine Morland in her infancy would have supposed her born to be an heroine. Her situation in life, the character of her father and mother, her own person and disposition, were all 5 equally against her.

Her father was a clergyman, without being neglected, or poor, and a very respectable man, though his name was Richard—and he had never been handsome. He had a considerable independence besides 10 two good livings—and he was not in the least addicted to locking up his daughters. Her mother was a woman of useful plain sense, with a good temper, and, what is more remarkable, with a good constitution. She had three sons before Catherine was born; and instead of 15 dying in bringing the latter into the world, as anybody might expect, she still lived on—lived to have six children more—to see them growing up around her, and to enjoy excellent health herself. A family of ten children will be always called a fine family, where there 20 are heads and arms and legs enough for the number; but the Morlands had little other right to the word, for they were in general very plain, and Catherine, for many years of her life, as plain as any. She had a thin awkward figure, a sallow skin without colour, dark lank 25 hair, and strong features—so much for her person; and not less unpropitious for heroism seemed her mind. She was fond of all boy's plays, and greatly preferred cricket not merely to dolls, but to the more heroic 30 enjoyments of infancy, nursing a dormouse, feeding a canary-bird, or watering a rose-bush. Indeed she had no taste for a garden; and if she gathered flowers at all, it was chiefly for the pleasure of mischief—at least so it was conjectured from her always preferring those 35 which she was forbidden to take. Such were her propensities—her abilities were quite as extraordinary. She never could learn or understand anything before she was taught; and sometimes not even then, for she was often inattentive, and occasionally stupid. Her mother was three months in teaching her only 40 to repeat the "Beggar's Petition"; and after all, her next sister, Sally, could say it better than she did. Not that Catherine was always stupid—by no means; she learnt the fable of "The Hare and Many Friends" as quickly as any girl in England. Her mother wished her 45 to learn music; and Catherine was sure she should like it, for she was very fond of tinkling the keys of the old forlorn spinner; so, at eight years old she began. She learnt a year, and could not bear it; and Mrs. Morland, who did not insist on her daughters being accomplished

50 in spite of incapacity or distaste, allowed her to leave off. The day which dismissed the music-master was one of the happiest of Catherine's life. Her taste for drawing was not superior; though whenever she could obtain the outside of a letter from her mother or seize 55 upon any other odd piece of paper, she did what she could in that way, by drawing houses and trees, hens and chickens, all very much like one another. Writing and accounts she was taught by her father; French by her mother: her proficiency in either was not 60 remarkable, and she shirked her lessons in both whenever she could. What a strange, unaccountable character!—for with all these symptoms of profligacy at ten years old, she had neither a bad heart nor a bad temper, was seldom stubborn, scarcely ever 65 quarrelsome, and very kind to the little ones, with few interruptions of tyranny; she was moreover noisy and wild, hated confinement and cleanliness, and loved nothing so well in the world as rolling down the green slope at the back of the house.

1

What effect does the phrase "What a strange, unaccountable character!" (lines 61-62) have on the tone of the passage?

- A) It creates a harsh tone that suggests Catherine's parents are responsible for her educational deficiencies.
- B) It creates a gently mocking tone that implies Catherine's shortcomings are not unusual in a young girl.
- C) It creates a puzzled tone that emphasizes the inexplicable nature of Catherine's difficulties.
- D) It creates a resigned tone that suggests Catherine's difficulties are irreversible.

7. This passage is adapted from Jamaica Kincaid, *Annie John*, © 1985 Farrar, Straus and Giroux. The protagonist is a girl growing up in the Caribbean.

It was the first day of a new term, Miss Nelson said, so we would not be attending to any of our usual subjects; instead, we were to spend the morning in contemplation and reflection and writing something she described as an “autobiographical essay.” In the afternoon, we would read aloud to each other our auto-biographical essays. (I knew quite well about “autobiography” and “essay,” but reflection and contemplation! A day at school spent in such a way!

10 Of course, in most books all the good people were always contemplating and reflecting before they did anything. Perhaps in her mind’s eye she could see our future and, against all prediction, we turned out to be good people.) On hearing this, a huge sigh went up from the girls.

Half the sighs were in happiness at the thought of sitting and gazing off into clear space, the other half in unhappiness at the misdeeds that would have to go unaccomplished. I joined the happy half, because I knew it would please Miss Nelson, and, my own selfish interest aside, I liked so much the way she wore her ironed hair and her long-sleeved blouse and box-pleated skirt that I wanted to please her.

The morning was uneventful enough: a girl spilled ink from her inkwell all over her uniform; a girl broke her pen nib and then made a big to-do about replacing it; girls twisted and turned in their seats and pinched each other’s bottoms; girls passed notes to each other. All this Miss Nelson must have seen and heard, but she didn’t say anything—only kept reading her book: an elaborately illustrated edition of *The Tempest*, as later, passing by her desk, I saw. Midway in the morning, we were told to go out and stretch our legs and breathe some fresh air for a few minutes; when we returned, we were given glasses of cold lemonade and a slice of bun to refresh us.

As soon as the sun stood in the middle of the sky, we were sent home for lunch. The earth may have grown an inch or two larger between the time I had walked to school that morning and the time I went home to lunch, for some girls made a small space for me in their little band. But I couldn’t pay much attention to them; my mind was on my new surroundings, my new teacher, what I had written in my nice new notebook with its black-all-mixed-up-with-white cover and smooth lined pages (so glad was I to get rid of my old notebooks, which had on their covers a picture of a wrinkled-up woman wearing a crown on her head and a neckful and armfuls of diamonds and pearls—their pages so coarse, as if they were made of cornmeal).

I flew home. I must have eaten my food. By half past one, we were sitting under a flamboyant tree in a secluded part of our schoolyard, our auto-biographical essays in hand. We were about to read aloud what

- 55 we had written during our morning of contemplation and reflection. In response to Miss Nelson, each girl stood up and read her composition. One girl told of a much revered and loved aunt who now lived in England and of how much she looked forward to 60 one day moving to England to live with her aunt; one girl told of her brother studying medicine in Canada and the life she imagined he lived there (it seemed quite odd to me); one girl told of the fright she had when she dreamed she was dead, and of the matching 65 fright she had when she woke and found that she wasn’t (everyone laughed at this, and Miss Nelson had to call us to order over and over); one girl told of how her oldest sister’s best friend’s cousin’s best friend (it was a real rigmarole) had gone on a Girl Guide 70 jamboree held in Trinidad and met someone who millions of years ago had taken tea with Lady Baden-Powell; one girl told of an excursion she and her father had made to Redonda, and of how they had seen some booby birds tending their chicks. Things 75 went on in that way, all so playful, all so imaginative. I began to wonder about what I had written, for it was the opposite of playful and it was the opposite of imaginative. What I had written was heartfelt, and, except for the very end, it was all too true.

1

Over the course of the passage, the narrator’s attitude shifts from

- A) eagerness to begin an assignment to uncertainty about sharing her work.
- B) disappointment about starting school to excitement about the future.
- C) disdain for some of her classmates to admiration for her teacher.
- D) doubt in her ability to keep up with her friends to pride in her accomplishments.

2

Which lines provide the best evidence for the answer to the previous question?

- A) Lines 19-23 (“I joined hearing...her”)
- B) Lines 42-46 (“But...pages”)
- C) Lines 57-60 (“One girl...aunt”)
- D) Lines 76-78 (“I began...true”)

8. This passage is adapted from Barry Schwartz, "More Isn't Always Better," © 2006 by *Harvard Business Review*.

Marketers assume that the more choices they offer, the more likely customers will be able to find just the right thing. They assume, for instance, that offering 50 styles of jeans instead of two increases the chances that 5 shoppers will find a pair they really like. Nevertheless, research now shows that there can be too much choice; when there is, consumers are less likely to buy anything at all, and if they do buy, they are less satisfied with their selection.

10 It all began with jam. In 2000, psychologists Sheena Iyengar and Mark Lepper published a remarkable study. On one day, shoppers at an upscale food market saw a display table with 24 varieties of gourmet jam. Those who sampled the spreads received a coupon for \$1 off 15 any jam. On another day, shoppers saw a similar table, except that only six varieties of the jam were on display. The large display attracted more interest than the small one. But when the time came to purchase, people who saw the large display were one-tenth as likely to buy as 20 people who saw the small display.

Other studies have confirmed this result that more choice is not always better. As the variety of snacks, soft drinks, and beers offered at convenience stores increases, for instance, sales volume and customer 25 satisfaction decrease. Moreover, as the number of retirement investment options available to employees increases, the chance that they will choose any decreases. These studies and others have shown not only that excessive choice can produce "choice 30 paralysis," but also that it can reduce people's satisfaction with their decisions, even if they made good ones. My colleagues and I have found that increased choice decreases satisfaction with matters as trivial as ice cream flavors and as significant as jobs.

35 These results challenge what we think we know about human nature and the determinants of well-being. Both psychology and business have operated on the assumption that the relationship between choice and well-being is straightforward: The more choices people 40 have, the better off they are. In psychology, the benefits of choice have been tied to autonomy and control. In business, the benefits of choice have been tied to the benefits of free markets more generally. Added options make no one worse off, and they are bound to make 45 someone better off.

Choice is good for us, but its relationship to satisfaction appears to be more complicated than we

had assumed. There is diminishing marginal utility in having alternatives; each new option subtracts a little 50 from the feeling of well-being, until the marginal benefits of added choice level off. What's more, psychologists and business academics alike have largely ignored another outcome of choice: More of it requires increased time and effort and can lead to 55 anxiety, regret, excessively high expectations, and self-blame if the choices don't work out. When the number of available options is small, these costs are negligible, but the costs grow with the number of options. Eventually, each new option makes us feel 60 worse off than we did before.

Without a doubt, having more options enables us, most of the time, to achieve better objective outcomes. Again, having 50 styles of jeans as opposed to two increases the likelihood that customers will find a pair 65 that fits. But the subjective outcome may be that shoppers will feel overwhelmed and dissatisfied. This dissociation between objective and subjective results creates a significant challenge for retailers and marketers that look to choice as a way to enhance the 70 perceived value of their goods and services.

Choice can no longer be used to justify a marketing strategy in and of itself. More isn't always better, either for the customer or for the retailer.

Discovering how much assortment is warranted is a 75 considerable empirical challenge. But companies that get the balance right will be amply rewarded.

### 1

What effect does the author's reference to "My colleagues and I" (line 32) have on the tone of the passage?

- A) It creates a dubious tone that conveys the author's skepticism toward Iyengar and Lepper's research.
- B) It creates a reassuring tone that conveys the power of individual experience.
- C) It creates a conversational tone that conveys potentially dry information in a personal manner.
- D) It creates a distraught tone that conveys the uncertainty accompanying excessive choice.

2

The author's attitude toward Iyengar and Lepper's research is best described as one of

- A) skepticism.
- B) approval.
- C) defensiveness.
- D) indifference.

3

Which lines provide the best evidence for the answer to the previous question?

- A) Lines 17-18 ("The large...one")
- B) Lines 32-34 ("My...jobs")
- C) Lines 40-41 ("In...control")
- D) Lines 48-49 ("There is...alternatives")

4

The author would most likely consider the viewpoint in lines 39-40 ("The more...are")

- A) an example of a belief with which he does not agree.
- B) a potentially valid assertion that has not yet been conclusively proven.
- C) a straightforward statement of fact.
- D) a belief that has long been considered controversial.

5

Which lines provide the best evidence for the answer to the previous question?

- A) Line 15 ("On...table")
- B) Lines 40-43 ("In...generally")
- C) Lines 61-62 ("Without...outcomes")
- D) Lines 72-73 ("More...retailer")

## Rhetorical Strategy Exercises

1. These are stimulating times for anyone interested in questions of animal consciousness. On what seems like a monthly basis, scientific teams announce the results of new experiments, adding to a preponderance  
5 of evidence that we've been underestimating animal minds, even those of us who have rated them fairly highly. New animal behaviors and capacities are observed in the wild, often involving tool use—or at least object manipulation—the very kinds of activity  
10 that led the distinguished zoologist Donald R. Griffin to found the field of cognitive ethology (animal thinking) in 1978: octopuses piling stones in front of their hideyholes, to name one recent example; or dolphins fitting marine sponges to their beaks in order to dig for  
15 food on the seabed; or wasps using small stones to smooth the sand around their egg chambers, concealing them from predators. At the same time neurobiologists have been finding that the physical structures in our own brains most commonly held responsible for  
20 consciousness are not as rare in the animal kingdom as had been assumed. Indeed they are common. All of this work and discovery appeared to reach a kind of crescendo last summer, when an international group of prominent neuroscientists meeting at the University of  
25 Cambridge issued “The Cambridge Declaration on Consciousness in Non-Human Animals,” a document stating that “humans are not unique in possessing the neurological substrates that generate consciousness.” It goes further to conclude that numerous documented  
30 animal behaviors must be considered “consistent with experienced feeling states.”

Which choice best describes the organization of this passage?

- A) A theory is offered, an experiment is presented, and a critique is offered.
- B) An existing model is discussed, its flaws are examined, and a new model is proposed.
- C) Several examples of animal behavior are presented, and their significance is analyzed.
- D) An assertion is made, and specific examples are provided to support it.

In line 21, the author's focus shifts from

- A) a series of examples to a description of an outcome.
- B) focus on an individual to a consideration of a group.
- C) an examination of a problem to a proposal of a solution.
- D) a discussion of a claim to a questioning of that claim.

2. The following passage is adapted from Jane Austen, *Northanger Abbey*, originally published in 1817.

No one who had ever seen Catherine Morland in her infancy would have supposed her born to be an heroine. Her situation in life, the character of her father and mother, her own person and disposition, were all  
5 equally against her.  
Her father was a clergyman, without being neglected, or poor, and a very respectable man, though his name was Richard—and he had never been handsome. He had a considerable independence besides  
10 two good livings—and he was not in the least addicted to locking up his daughters. Her mother was a woman of useful plain sense, with a good temper, and, what is more remarkable, with a good constitution. She had three sons before Catherine was born; and instead of  
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35 Such were her propensities—her abilities were quite as extraordinary. She never could learn or understand anything before she was taught; and sometimes not even then, for she was often inattentive, and occasionally stupid. Her mother was three months in teaching her  
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65 quarrelsome, and very kind to the little ones, with few interruptions of tyranny; she was moreover noisy and wild, hated confinement and cleanliness, and loved nothing so well in the world as rolling down the green slope at the back of the house.

This passage is written from the perspective of

- A) a member of Catherine's family who is critical of Catherine's upbringing.
- B) an observer familiar with Catherine and her family.
- C) a character who finds herself at odds with her family.
- D) a character who is puzzled by the constraints placed on her by society.

The words "never," "not even," and "inattentive" (lines 36-38) mainly have the effect of

- A) rebuking Catherine's mother for her excessive demands on her daughter.
- B) pointing out Catherine's contrary nature.
- C) calling attention to Catherine's lack of precociousness.
- D) provoking a sense of sympathy for Catherine's misbehavior.

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## I

This passage is written from the perspective of

- A) an interested observer who believes that customers should be offered as many choices as possible.
- B) a person who is knowledgeable about economic theory but who lacks practical experience.
- C) a researcher actively engaged in studying the effects of choice on consumer behavior.
- D) a marketing expert who wants to advertise products more effectively.

Which of the following best describes the organization of the first two paragraphs (lines 1-20)?

- A) A claim is presented, an opposing claim is offered, and evidence is provided.
- B) An unexpected finding is described, and an attempt to dismiss the finding is made.
- C) A hypothesis is proposed, an experiment is carried out, and the results are analyzed.
- D) Competing explanations for a phenomenon are discussed, and the results of a study designed to test them are evaluated.

4. The following passage is adapted from Olympe de Gouges, *Declaration of the Rights of Women*. It was initially published in 1791, during the French Revolution, and was written in response to the *Declaration of the Rights of Man* (1789).

Woman, wake up; the toxin of reason is being heard throughout the whole universe; discover your rights. The powerful empire of nature is no longer surrounded by prejudice, fanaticism, superstition, and lies. The flame of truth has dispersed all the clouds of folly and usurpation. Enslaved man has multiplied his strength and needs recourse to yours to break his chains. Having become free, he has become unjust to his companion. Oh, women, women! When will you cease to be blind? What advantage have you received from the Revolution? A more pronounced scorn, a more marked disdain. In the centuries of corruption you ruled only over the weakness of men. The reclamation of your patrimony, based on the wise decrees of nature – what have you to dread from such a fine undertaking? Do you fear that our legislators, correctors of that morality, long ensnared by political practices now out of date, will only say again to you: women, what is there in common between you and us? Everything, you will have to answer. If they persist in their weakness in putting this hypocrisy in contradiction to their principles, courageously oppose the force of reason to the empty pretensions of superiority; unite yourselves beneath the standards of philosophy; deploy all the energy of your character. Regardless of what barriers confront you, it is in your power to free yourselves; you have only to want to. Let us pass not to the shocking tableau of what you have been in society; and since national education is in question at this moment, let us see whether our wise legislators will think judiciously about the education of women.

Women have done more harm than good. Constraint and dissimulation have been their lot. What force has robbed them of, ruse returned to them; they had recourse to all the resources of their charms, and the most irreproachable persons did not resist them. Poison and the sword were both subject to them; they commanded in crime as in fortune. The French government, especially, depended throughout the centuries on the nocturnal administrations of women; the cabinet could keep no secrets as a result of their indiscretions; all have been subject to the cupidity and ambition of this sex, formerly contemptible and respected, and since the revolution, respectable and scorned.

45 In this sort of contradictory situation, what remarks could I not make! I have but a moment to make them, but this moment will fix the attention of the remotest posterity. Under the Old Regime, all was vicious, all was guilty; but could not the amelioration of 50 conditions be perceived even in the substance of vices? A woman only had to be beautiful or amiable; when she possessed these two advantages, she saw a hundred fortunes at her feet. If she did not profit from them, she had a bizarre character or a rare philosophy 55 which made her scorn wealth; then she was deemed to be like a crazy woman. A young, inexperienced woman, seduced by a man whom she loves, will abandon her parents to follow him; the ingrate will leave her after a few years, and the older she has 60 become with him, the more inhuman is his inconstancy; if she has children, he will likewise abandon them. If he is rich, he will consider himself excused from sharing his fortune with his noble victims. If some involvement binds him to his duties, he will 65 deny them, trusting that the laws will support him. If he is married, any other obligation loses its rights. Then what laws remain to extirpate vice all the way to its root? The law of dividing wealth and public administration between men and women. It can easily 70 be seen that one who is born into a rich family gains very much from such equal sharing. But the one born into a poor family with merit and virtue – what is her lot? Poverty and opprobrium. If she does not precisely excel in music or painting, she cannot be admitted to 75 any public function when she has all the capacity for it.



Which of the following best characterizes the narrator's shift in focus in lines 45–46?

- A) She shifts from criticizing a group of people to praising that group.
- B) She shifts from discussing political affairs to discussing artistic affairs.
- C) She shifts from discussing opposing views to attempting to reconcile those views.
- D) She shifts from describing a problem to offering a personal opinion.

5. The following passage is adapted from “Scientists Discover Salty Aquifer, Previously Unknown Microbial Habitat Under Antarctica,” © 2015 by Dartmouth College.

Using an airborne imaging system for the first time in Antarctica, scientists have discovered a vast network of unfrozen salty groundwater that may support previously unknown microbial life deep under the coldest, driest desert on our planet. The findings shed new light on ancient climate change on Earth and provide strong evidence that a similar briny aquifer could support microscopic life on Mars. The scientists used SkyTEM, an airborne electromagnetic sensor, to detect and map 10 otherwise inaccessible subterranean features.

The system uses antennae suspended beneath a helicopter to create a magnetic field that reveals the subsurface to a depth of about 1,000 feet. Because a helicopter was used, large areas of rugged terrain could 15 be surveyed. The SkyTEM team was funded by the National Science Foundation and led by researchers from the University of Tennessee, Knoxville (UTK), and Dartmouth College, which oversees the NSF’s SkyTEM project.

20 “These unfrozen materials appear to be relics of past surface ecosystems and our findings provide compelling evidence that they now provide deep subsurface habitats for microbial life despite extreme environmental conditions,” says lead author Jill Mikucki, 25 an assistant professor at UTK. “These new below-ground visualization technologies can also provide insight on glacial dynamics and how Antarctica responds to climate change.”

Co-author Dartmouth Professor Ross Virginia is 30 SkyTEM’s co-principal investigator and director of Dartmouth’s Institute of Arctic Studies. “This project is studying the past and present climate to, in part, understand how climate change in the future will affect biodiversity and ecosystem processes,” Virginia says. 35 “This fantastic new view beneath the surface will help us sort out competing ideas about how the McMurdo Dry Valleys have changed with time and how this history influences what we see today.”

The researchers found that the unfrozen brines form 40 extensive, interconnected aquifers deep beneath glaciers and lakes and within permanently frozen soils. The brines extend from the coast to at least 7.5 miles inland in the McMurdo Dry Valleys, the largest ice-free region in Antarctica. The brines could be due to freezing and/or 45 deposits. The findings show for the first time that the Dry Valleys’ lakes are interconnected rather than isolated; connectivity between lakes and aquifers is important in sustaining ecosystems through drastic climate change, such as lake dry-down events. The findings also challenge

50 the assumption that parts of the ice sheets below the pressure melting point are devoid of liquid water. In addition to providing answers about the biological adaptations of previously unknown ecosystems that persist in the extreme cold and dark of the Antarctic winter, the new study could help scientists to understand whether similar conditions might exist elsewhere in the solar system, specifically beneath the surface of Mars, which has many similarities to the Dry Valleys. Overall, the Dry Valleys ecosystem – 55 cold, vegetation-free and home only to microscopic animal and plant life – resembles, during the Antarctic summer, conditions on the surface on Mars.

SkyTEM produced images of Taylor Valley along the Ross Sea that suggest briny sediments exist at 60 subsurface temperatures down to perhaps -68°F, which is considered suitable for microbial life. One of the studied areas was lower Taylor Glacier, where the data suggest ancient brine still exists beneath the glacier. That conclusion is supported by the presence 65 of Blood Falls, an iron-rich brine that seeps out of the glacier and hosts an active microbial ecosystem.

70 Scientists’ understanding of Antarctica’s underground environment is changing dramatically as research reveals that subglacial lakes are widespread and that at least half of the areas covered by the ice sheet are akin to wetlands on other continents. But groundwater in the ice-free regions and along the coastal margins remains poorly understood.

1

Which choice best describes the organization of this passage?

- A) An experiment is discussed, and several interpretations of its results are analyzed.
- B) A finding is described, and the implications of that finding are considered.
- C) A hypothesis is presented, an attempt to validate it using new technology is described, and the resulting data are evaluated.
- D) An ecosystem on Earth is compared to an ecosystem on Mars, and the origin of each is discussed.

## Paired Passage Exercises

2. Passage 1 is adapted from a 1774 speech to Congress by Joseph Galloway. Passage 2 is adapted from Alexander Hamilton, "A Full Vindication of the Measures of the Congress." Both were written in 1774. As the British imposed a series of taxes on the American colonists, tensions grew between those who wished to remain loyal to Britain and those who wanted greater independence.

### Passage 1

The discovery of the Colonies was made under a commission granted by the supreme authority of the British State, that they have been settled under that authority, and therefore are truly the property of that State. Parliamentary jurisdiction has been constantly exercised over them from their first settlement; its executive authority has ever run through all their inferior political systems: the Colonists have ever sworn allegiance to the British State, and have been considered, both by the State and by themselves, as subjects of the British Government. Protection and allegiance are reciprocal duties; the one cannot exist without the other. The Colonies cannot claim the protection of Britain upon any principle of reason or law, while they deny its supreme authority. Upon this ground the authority of Parliament stands too firm to be shaken by any arguments whatever; and therefore to deny that authority, and at the same time to declare their incapacity to be represented, amounts to a full and explicit declaration of independence.

As to the tax, it is neither unjust or oppressive, it being rather a relief than a burthen\*; but it is want of constitutional principle in the authority that passed it, which is the ground for complaint. This, and this only, is the source of American grievances...

If we do not approve of a representation in Parliament, let us ask for a participation in the freedom and power of the English constitution in some other mode of incorporation... I therefore beseech you, by the respect you are bound to pay to the instructions of your constituents, by the regard you have for the honor and safety of your country, and as you wish to avoid a war with Great-Britain, which must terminate, at all events in the ruin of America, not to rely on a denial of the authority of Parliament, a refusal to be represented... because whatever protestations, in that case, may be made to the contrary, it will prove to the world that we intend to throw off our allegiance to the State, and to involve the two countries in all the horrors of a civil war.

\*a burden

### Passage 2

That Americans are entitled to freedom, is incontrovertible upon every rational principle. All men have one common original: they participate in one common nature, and consequently have one common right. No reason can be assigned why one man should exercise any power, or preeminence over his fellow creatures more than another; unless they have voluntarily veiled him with it. Since then, Americans have not by any act of theirs empowered the British Parliament to make laws for them, it follows they can have no just authority to do it.

Besides the clear voice of natural justice in this respect, the fundamental principles of the English constitution are in our favor. It has been repeatedly demonstrated, that the idea of legislation, or taxation, when the subject is not represented, is inconsistent with that. Nor is this all, our charters, the express conditions on which our progenitors relinquished their native countries, and came to settle in this, preclude every claim of ruling and taxing us without our assent.

Every subterfuge that sophistry has been able to invent, to evade or obscure this truth, has been refuted by the most conclusive reasonings; so that we may pronounce it a matter of undeniable certainty, that the pretensions of Parliament are contradictory to the law of nature, subversive of the British constitution, and destructive of the faith of the most solemn compacts.

What then is the subject of our controversy with the mother country? It is this, whether we shall preserve that security to our lives and properties, which the law of nature, the genius of the British constitution, and our charters afford us or whether we shall resign them into the hands of the British House of Commons, which is no more privileged to dispose of them than the Grand Mogul? What can actuate those men, who labor to delude any of us into an opinion, that the object of contention between the parents and the colonies is only three pence duty upon tea? or that the commotions in America originate in a plan, formed by some turbulent men to erect it into a republican government? The parliament claims a right to tax us in all cases whatsoever; its late laws are in virtue of that claim. How ridiculous then is it to affirm, that we are quarrelling for the trifling Aim of three pence a pound on tea; when it is evidently the principle against which we contend.

1 Which choice best describes the relationship between the two passages?

- A) Passage 2 presents a personal account of a conflict that Passage 1 discusses objectively.
- B) Passage 2 rejects a line of reasoning that Passage 1 advances.
- C) Passage 2 takes a practical view of a reaction that Passage 1 approaches idealistically.
- D) Passage 2 provides an example of an idea described in Passage 1.

2 Both passages discuss the tensions between Britain and the Colonies in terms of

- A) financial matters.
- B) moral obligations.
- C) religious freedom.
- D) historical conflicts.

3 The author of Passage 2 would most likely respond to the statement in lines 13–17 of Passage 1 (“The Colonies...whatever”) with

- A) approval, because levying taxes is a central purpose of government.
- B) skepticism, because the actions of Parliament are at odds with natural and British law.
- C) scorn, because no individual has the inherent authority to rule over others.
- D) acceptance, because the Colonies must reaffirm their allegiance to Britain.

4 Galloway in Passage 1 would most likely characterize Hamilton’s statement in lines 48–51 of Passage 2 (“Americans...do it”) as

- A) too radical to be taken seriously by the majority of citizens.
- B) inconsistent with the need to establish reliable systems of trade.
- C) a principled defense of national sovereignty.
- D) a troubling misconception of an established relationship.

5 Galloway in Passage 1 and Hamilton in Passage 2 would be most likely to agree with which of the following statements?

- A) The English constitution is worthy of great respect.
- B) Regulations that conflict with the laws of nature must be overturned.
- C) Historical ties between nations should be preserved at all cost.
- D) Individuals should only be taxed in proportion to their incomes.

2. Passage 1 is adapted from the "Atlanta Compromise" speech by Booker T. Washington, delivered in 1895. Passage 2 is adapted from a 1903 essay by W.E.B. DuBois. DuBois and Washington were among the most influential leaders in the African-American community during the late nineteenth and early twentieth centuries.

### Passage 1

Ignorant and inexperienced, it is not strange that in the first years of our new life we began at the top instead of at the bottom; that a seat in Congress or the state legislature was more sought than real estate or industrial skill; that the political convention or stump speaking had more attractions than starting a dairy farm or truck garden. A ship lost at sea for many days suddenly sighted a friendly vessel. From the mast of the unfortunate vessel was seen a signal, "Water,  
5 water; we die of thirst!" The answer from the friendly vessel at once came back, "Cast down your bucket where you are." A second time the signal, "Water, water; send us water!" ran up from the distressed vessel, and was answered, "Cast down your bucket  
10 where you are." And a third and fourth signal for water was answered, "Cast down your bucket where you are." The captain of the distressed vessel, at last heeding the injunction, cast down his bucket, and it came up full of fresh, sparkling water from the mouth of the  
15 Amazon River. To those of my race who depend on bettering their condition in a foreign land or who underestimate the importance of cultivating friendly relations with the Southern white man, who is their next-door neighbor, I would say: "Cast down your  
20 bucket where you are"— cast it down in making friends in every manly way of the people of all races by whom we are surrounded...

No race can prosper till it learns that there is as much dignity in tilling a field as in writing a poem. It is  
30 at the bottom of life we must begin, and not at the top. To those of the white race who look to the incoming of those of foreign birth and strange tongue and habits for the prosperity of the South, were I permitted I would repeat what I say to my own race, "Cast down  
35 your bucket where you are." Cast it down among the eight millions of Negroes whose habits you know, whose fidelity and love you have tested...As we have proved our loyalty to you in the past, in nursing your children, watching by the sick-bed of your mothers  
40 and fathers, and often following them with tear-dimmed eyes to their graves, so in the future, in our humble way, we shall stand by you with a devotion that no foreigner can approach, ready to lay down our lives,

if need be, in defense of yours, interlacing our  
45 industrial, commercial, civil, and religious life with yours in a way that shall make the interests of both races one. In all things that are purely social we can be as separate as the fingers, yet one as the hand in all things essential to mutual progress.

### Passage 2

50 The Negro race, like all races, is going to be saved by its exceptional men. The problem of education, then, among Negroes must first of all deal with the Talented Tenth; it is the problem of developing the Best of this race that they may guide the Mass away  
55 from the contamination and death of the Worst, in their own and other races. Now the training of men is a difficult and intricate task. Its technique is a matter for educational experts, but its object is for the vision of seers. If we make money the objects of  
60 man-training, we shall develop money-makers but not necessarily men; if we make technical skill the object of education, we may possess artisans but not, in nature, men....

I am an earnest advocate of manual training and  
65 trade teaching for black boys, and for white boys, too. I believe that next to the founding of Negro colleges the most valuable addition to Negro education since the war, has been industrial training for black boys. Nevertheless, I insist that the object  
70 of all true education is not to make men carpenters, it is to make carpenters men; there are two means of making the carpenter a man, each equally important: the first is to give the group and community in which he works, liberally trained teachers and leaders to  
75 teach him and his family what life means; the second is to give him sufficient intelligence and technical skill to make him an efficient workman; the first object demands the Negro college and college-bred men—not a quantity of such colleges, but a few of  
80 excellent quality; not too many college-bred men, but enough to leaven the lump, to inspire the masses, to raise the Talented Tenth to leadership; the second object demands a good system of common schools, well-taught, conveniently located and properly  
85 equipped.

1

Which idea is supported by the authors of both passages?

- A) The primary goal of education is to ensure skill and efficiency.
- B) It is possible to find fulfillment in a wide range of occupations.
- C) Formal education should be reserved for only the most talented students.
- D) Individuals can most effectively improve their lives through education.

4

Based on Passage 1, Washington would most likely characterize the viewpoint described by DuBois in lines 78–85 of Passage 2 (“the first... equipped”) as

- A) economically impractical.
- B) generally persuasive.
- C) overly ambitious.
- D) beyond reproach.

2

Which statement identifies a central conflict between the two passages?

- A) Washington proposes a broad system of education, while DuBois rejects that approach as impractical.
- B) Washington adopts an international perspective, while DuBois focuses on domestic interests.
- C) Washington focuses on improving the prospects of a group as a whole, while DuBois advocates the elevation of a narrow elite.
- D) Washington describes the nature of a problem, while DuBois emphasizes a possible solution.

3

DuBois in Passage 2 would most likely have responded to lines 29–30 (“It is...top”) of Passage 1 with

- A) appreciation, because citizens of a democracy should not have to demonstrate their loyalty.
- B) sympathy, because citizens of a democracy should play an active role in their communities.
- C) disagreement, because true freedom cannot be attained without education.
- D) skepticism, because it ignores the capabilities of certain individuals.

3. Passage 1 is adapted from the website locavores.com, © 2010. Passage 2 is adapted from Ronald Bailey, "The Food Miles Mistake," © 2008 Reason magazine.

### Passage 1

Our food now travels an average of 1,500 miles before ending up on our plates. This globalization of the food supply has serious consequences for the environment, our health, our communities and our 5 tastebuds. Much of the food grown in the breadbasket surrounding us must be shipped across the country to distribution centers before it makes its way back to our supermarket shelves. Because uncounted costs of this long distance journey (air pollution and global 10 warming, the ecological costs of large scale monoculture, the loss of family farms and local community dollars) are not paid for at the checkout counter, many of us do not think about them at all.

What is eaten by the great majority of North 15 Americans comes from a global everywhere, yet from nowhere that we know in particular. How many of our children even know what a chicken eats or how an onion grows? The distance from which our food comes represents our separation from the 20 knowledge of how and by whom what we consume is produced, processed, and transported. And yet, the quality of a food is derived not merely from its genes and the greens that fed it, but from how it is prepared and cared for all the way until it reaches our mouths. 25 If the production, processing, and transport of what we eat is destructive of the land and of human community — as it very often is — how can we understand the implications of our own participation in the global food system when those processes are 30 located elsewhere and so are obscured from us? How can we act responsibly and effectively for change if we do not understand how the food system works and our own role within it.

Corporations, which are the principal beneficiaries 35 of a global food system, now dominate the production, processing, distribution, and consumption of food, but alternatives are emerging which together could form the basis for foodshed development. Just as many farmers are recognizing the social and 40 environmental advantages to sustainable agriculture, so are many consumers coming to appreciate the benefits of fresh and sustainably produced food. Such producers and consumers are being linked through such

innovative arrangements as community supported agriculture and farmers' markets. Alternative producers, alternative consumers, and alternative small entrepreneurs are rediscovering community and finding common ground.

### Passage 2

In their recent policy primer for the Mercatus 50 Center at George Mason University, economic geographer Pierre Desrochers and economic consultant Hiroko Shimizu challenge the notion that food miles — the distance food travels from farm to plate — are a good sustainability indicator. As 55 Desrochers and Shimizu point out, the food trade has been historically driven by urbanization. As agriculture became more efficient, people were liberated from farms and able to develop other skills that helped raise general living standards. People 60 freed from having to scabble for food, for instance, could work in factories, write software, or become physicians. Modernization is a process in which people get further and further away from the farm.

Modern technologies like canning and refrigeration 65 made it possible to extend the food trade from staple grains and spices to fruits, vegetables, and meats. As a result, world trade in fruits and vegetables—fresh and processed—doubled in the 1980s and increased by 30 percent between 1990 and 2001. Fruits and 70 vegetables accounted for 22 percent of the exports of developing economies in 2001. If farmers, processors, shippers, and retailers did not profit from providing distant consumers with these foods, the foods wouldn't be on store shelves. And consumers, of 75 course, benefit from being able to buy fresh foods year around.

So just how much carbon dioxide is emitted by transporting food from farm to fork? Desrochers and Shimizu cite a comprehensive study done by the 80 United Kingdom's Department of Environment, Food and Rural Affairs (DEFRA) which reported that 82 percent of food miles were generated within the U.K. Consumer shopping trips accounted for 48 percent and trucking for 31 percent of British 85 miles. Air freight amounted to less than 1 percent of food miles. In total, food transportation accounted for only 1.8 percent of Britain's carbon dioxide emissions.

**1**

Which choice best describes the relationship between the two passages?

- A) Passage 2 offers an alternative explanation for a phenomenon that Passage 1 describes.
- B) Passage 2 proposes a solution to a problem that Passage 1 presents.
- C) Passage 2 expresses doubt about the benefits of a practice that Passage 1 advocates.
- D) Passage 2 provides historical context for a tradition that Passage 1 discusses.

**2**

The authors of both passages would most likely agree with which of the following statements about food?

- A) People must understand the food production system in order to make informed choices about their health.
- B) A significant amount of the food consumed today is not produced locally.
- C) Transporting food over long distances may reduce its quality.
- D) The corporate model of food production is a necessary aspect of urbanization.

**3**

How would the author of Passage 2 most likely respond to the discussion in lines 8-14 of Passage 1 (“Because...all”)?

- A) He would claim that most pollution comes from sources other than food transportation.
- B) He would assert that access to foods grown far away has led more people to adopt healthful diets.
- C) He would argue that transporting food over long distances is the best way to feed an increasingly urban population.
- D) He would point out that most family farms today exist by choice rather than necessity.

**4**

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 64-66 (“Modern...meats”)
- B) Lines 74-76 (“And...around”)
- C) Lines 82-83 (“82 percent...UK”)
- D) Lines 86-87 (“In...emissions”)

**5**

How would the author of Passage 1 most likely respond to the authors of Passage 2’s claim about “fresh foods” (line 75)?

- A) With skepticism, because the nutritional value of food transported over long distances may be compromised.
- B) With approval, because people should consume locally produced food whenever possible.
- C) With disdain, because the corporate model of food production cannot be altered.
- D) With interest, because new technologies may preserve foods for longer periods.

**6**

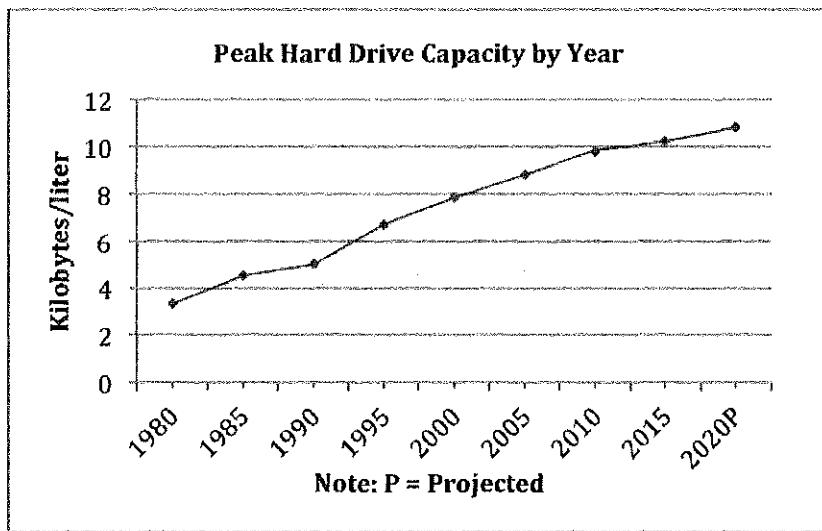
Which choice provides the best evidence for the answer to the previous question?

- A) Lines 5-6 (“Much...country”)
- B) Lines 14-15 (“What...everywhere”)
- C) Lines 21-24 (“And...mouths”)
- D) Lines 37-38 (“alternatives...development”)

## Graphics and Data Analysis Exercises

Note: Some of the graphs in this exercise refer to a passage when none is provided. This is a deliberate strategy intended to reinforce the point that many questions can be answered using the graph alone, even when the passage is mentioned in the question.

1.



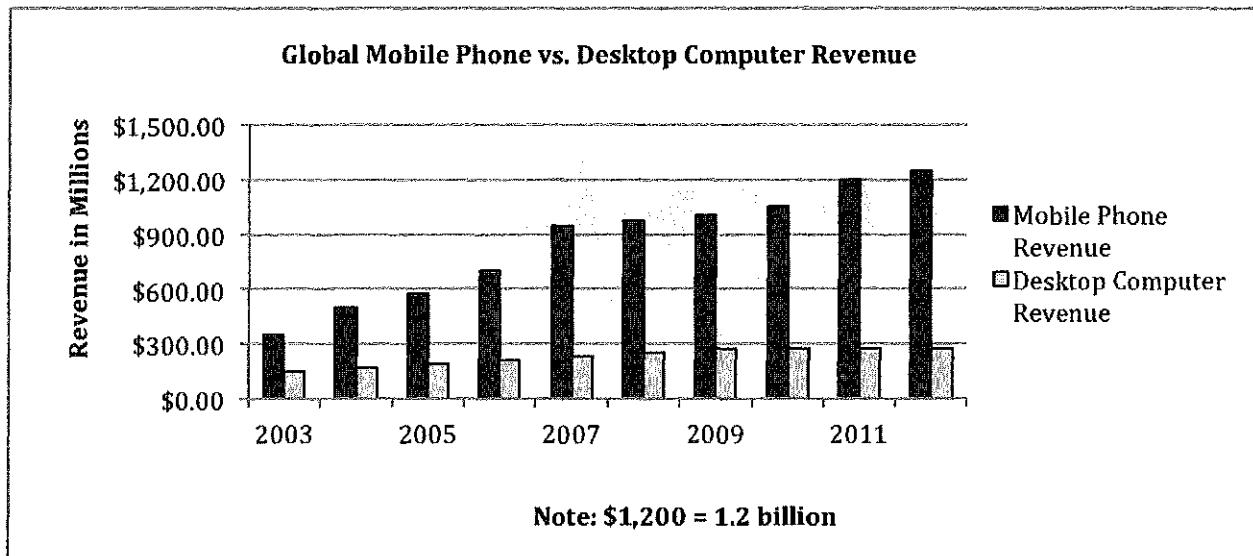
According to the graph, which statement is true about peak hard drive capacity in 2005?

- A) It was double the peak hard drive capacity of a decade earlier.
- B) It was around one kilobyte/liter higher than it had been five years earlier.
- C) It was higher than peak hard drive capacity in 2010.
- D) It was nine kilobytes/liter lower than it was in 2010.

Which choice best summarizes the information presented in the graph?

- A) Hard drive capacity is expected to peak sometime before 2020.
- B) Peak hard drive capacity was slightly higher in 2000 than in 1995.
- C) Expanding peak hard drive capacity has led to a large increase in computer sales.
- D) Peak hard drive capacity has increased dramatically since 1980.

2.



1.

According to the graph, which statement is true about the amount of revenue from mobile phone sales in 2008?

- A) It was slightly higher than the amount of revenue from PC sales in 2008.
- B) It was similar to the amount of revenue from PC sales in 2009.
- C) It was similar to the amount of revenue from mobile phone sales in 2009.
- D) It was wildly out of proportion to the amount of revenue from mobile phone sales the previous year.

3.

Data in the graph provide most direct support for which idea in the passage?

- A) People increasingly prefer mobile devices for common tasks.
- B) Consumers prefer to buy from companies whose products are already familiar to them.
- C) Mobile sales in new markets are substantially higher than are mobile sales in established markets.
- D) Tablets can now perform many of the same functions as mobile phones.

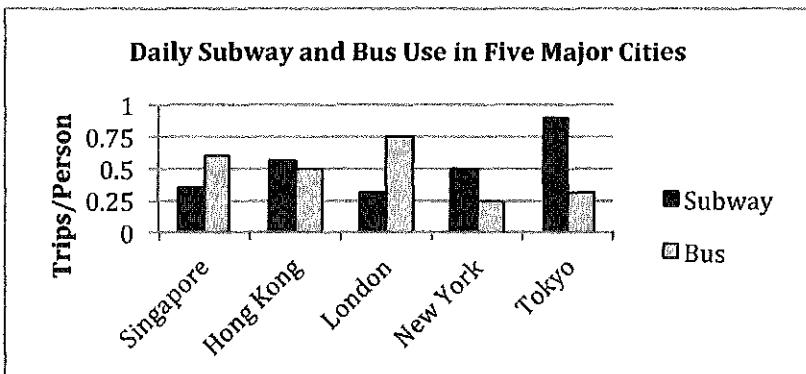
2.

Which information best summarizes the information presented in the graph?

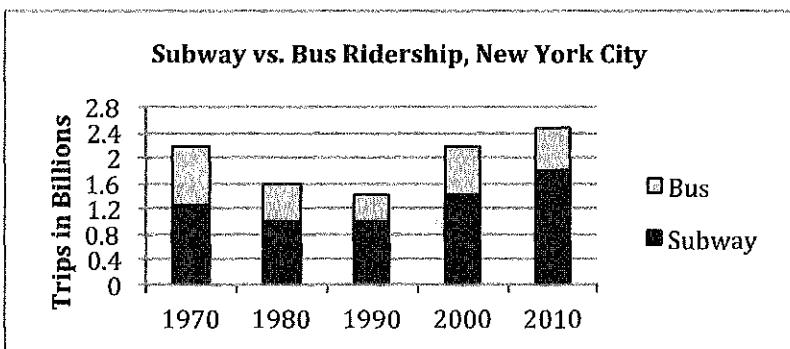
- A) The gap between revenue from mobile phone sales and PC sales has increased significantly.
- B) Revenue from PC sales increased more rapidly than did revenue from mobile phone sales.
- C) Revenue from tablet sales may soon overtake revenue from mobile phone sales.
- D) Revenue from mobile phone sales has risen steadily, while revenue from PC sales has declined.

3.

**Figure 1**



**Figure 2**



1

Information in figure 1 suggests that public transportation users in London

- A) take subways and buses at similar rates.
- B) are unusually reliant on buses.
- C) take at least one subway trip daily.
- D) take subways at about the same rate as people in New York.

3

Information in Figure 1 supports the author's point that buses are growing in popularity as a means of urban transport by indicating that

- A) many people around the world take at least one bus trip every day.
- B) bus ridership surpasses subway ridership in some major cities.
- C) people in Tokyo make far more trips by bus daily than they do trips by subway.
- D) the number of bus trips taken by people in major cities has substantially increased.

2

Which of the following statements about bus use in New York City is best supported by information in figure 2?

- A) It reached its highest point in 2010.
- B) It was lower in 1980 than it was in 1990.
- C) It began to rebound after 1990.
- D) It declined in every decade.

4

Taken together, the graphs suggest that public transit users in New York City

- A) use buses more often today than they did in previous decades.
- B) use buses about as often as they use the subway.
- C) rely more heavily on buses than do public transit users in other cities.
- D) increasingly prefer to travel by subway.

4. The following passage is adapted from Michael Anft, "Solving the Mystery of Death Valley's Walking Rocks," © 2011 by Johns Hopkins Magazine.

For six decades, observers have been confounded by the movement of large rocks across a dry lake bed in California's Death Valley National Park. Leaving flat trails behind them, rocks that weigh up to 100 pounds seemingly do Michael Jackson's moonwalk across the valley's sere, cracked surface, sometimes traveling more than 100 yards. Without a body of water to pick them up and move them, the rocks at Racetrack Playa, a flat space between the valley's high cliffs, have been the subject of much speculation, including whether they have been relocated by human pranksters or space aliens. The rocks have become the desert equivalent of Midwestern crop circles. "They really are a curiosity," says Ralph Lorenz, a planetary scientist at the Applied Physics Laboratory. "Some [people] have mentioned UFOs. But I've always believed that this is something science could solve."

It has tried. One theory holds that the rocks are blown along by powerful winds. Another posits that the wind pushes thin sheets of ice, created when the desert's temperatures dip low enough to freeze water from a rare rainstorm, and the rocks go along for the ride. But neither theory is rock solid. Winds at the playa aren't strong enough—some scientists believe that they'd have to be 100 miles per hour or more—to blow the rocks across the valley. And rocks subject to the "ice sailing theory" wouldn't create trails as they moved.

Lorenz and a team of investigators believe that a combination of forces may work to rearrange Racetrack Playa's rocks. "We saw that it would take a lot of wind to move these rocks, which are larger than you'd expect wind to move," Lorenz explains. "That led us to this idea that ice might be picking up the rocks and floating them." As they explained in the January issue of *The American Journal of Physics*, instead of moving along with wind-driven sheets of ice, the rocks may instead be lifted by the ice, making them more subject to the wind's force. The key, Lorenz says, is that the lifting by an "ice collar" reduces friction with the ground, to the point that the wind now has enough force to move the rock. The rock moves, the ice doesn't, and because part of the rock juts through the ice, it marks the territory it has covered. Lorenz's team came to its conclusion through a combination of intuition, lab work, and observation—not that the last part was easy. Watching the rocks travel is a bit like witnessing the rusting of a hubcap. Instances of movement are rare and last for only a few

seconds. Lorenz's team placed low-resolution cameras on the cliffs (which are about 30 miles from the nearest paved road) to take pictures once per hour. For the past three winters, the researchers have weathered extreme temperatures and several flat tires to measure how often the thermometer dips below freezing, how often the playa gets rain and floods, and the strength of the winds. "The measurements seem to back up our hypothesis," he says. "Any of the theories may be true at any one time, but ice rafting may be the best explanation for the trails we've been seeing. We've seen trails like this documented in Arctic coastal areas, and the mechanism is somewhat similar. A belt of ice surrounds a boulder during high tide, picks it up, and then drops it elsewhere." His "ice raft theory" was also borne out by an experiment that used the ingenuity of a high school science fair. Lorenz placed a basalt pebble in a Tupperware container with water so that the pebble projected just above the surface. He then turned the container upside down in a baking tray filled with a layer of coarse sand at its base, and put the whole thing in his home freezer. The rock's "keel" (its protruding part) projected downward into the sand, which simulated the cracked surface of the playa (which scientists call "Special K" because of its resemblance to cereal flakes). A gentle push or slight puff of air caused the Tupperware container to move, just as an ice raft would under the right conditions. The pebble made a trail in the soft sand. "It was primitive but effective," Lorenz says of the experiment. Lorenz has spent the last 20 years studying Titan, a moon of Saturn. He says that Racetrack Playa's surface mirrors that of a dried lakebed on Titan. Observations and experiments on Earth may yield clues to that moon's geology. "We also may get some idea of how climate affects geology—particularly as the climate changes here on Earth," Lorenz says. "When we study other planets and their moons, we're forced to use Occam's razor—sometimes the simplest answer is best, which means you look to Earth for some answers. Once you get out there on Earth, you realize how strange so much of its surface is. So, you have to figure there's weird stuff to be found on Titan as well." Whether that's true or not will take much more investigation. He adds: "One day, we'll figure all this out. For the moment, the moving rock present a wonderful problem to study in a beautiful place."

### Racetrack Playa Average vs. Maximum Wind Speed

	Average Wind Speed (miles/hour)	Peak Wind Speed (miles/hour)
<b>2008</b>		
November	20	67
December	19	72
January	21	78
February	23	92
March	25	87
<b>2009</b>		
November	19	69
December	21	71
January	20	76
February	22	90
March	24	89

1 According to the graph, which statement is true about wind speeds at Racketrack Playa in 2009?

- A) Peak wind speeds increased during every month between November and March.
- B) Average wind speeds increased during every month between November and March.
- C) Average wind speed in February was substantially higher than it was in December.
- D) The lowest peak wind speed occurred in November.

2 Which choice is best supported by the information in the chart?

- A) Peak wind speeds in 2009 were higher in every month than they were in 2008.
- B) Average wind speeds in some months exceeded peak wind speeds in others.
- C) The windiest months at Racetrack Playa were February and March.
- D) Peak wind speed in February 2009 was higher than peak wind speed in February 2008.

3 Which of the following statements from the passage is represented by the chart?

- A) Lines 16-17 (“But...solve”)
- B) Lines 23-26 (“Winds...valley”)
- C) Lines 39-42 (“The key...rock”)
- D) Lines 58-60 (“Any...seeing”)

5. The following passage is adapted from "Makerspaces, Hackerspaces, and Community Scale Production in Detroit and Beyond," © 2013 by Sean Ansanelli.

During the mid-1980s, spaces began to emerge across Europe where computer hackers could convene for mutual support and camaraderie. In the past few years, the idea of fostering such shared, physical spaces has been rapidly adapted by the diverse and growing community of "makers," who seek to apply the idea of "hacking" to physical objects, processes, or anything else that can be deciphered and improved upon.

A hackerspace is described by [hackerspaces.org](http://hackerspaces.org) as a "community-operated physical space where people with common interests, often in computers, technology, science, digital art or electronic art, can meet, socialize, and/or collaborate." Such spaces can vary in size, available technology, and membership structure (some being completely open), but generally share community-oriented characteristics. Indeed, while the term "hacker" can sometimes have negative connotations, modern hackerspaces thrive off of community, openness, and assimilating diverse viewpoints – these often being the only guiding principles in otherwise informal organizational structures.

In recent years, the city of Detroit has emerged as a hotbed for hackerspaces and other DIY ("Do-It-Yourself") experiments. Several hackerspaces can already be found throughout the city and several more are currently in formation. Of course, Detroit's attractiveness for such projects can be partially attributed to cheap real estate, which allows aspiring hackers to acquire ample space for experimentation. Some observers have also described this kind of making and tinkering as embedded in the DNA of Detroit's residents, who are able to harness substantial intergenerational knowledge and attract like-minded individuals. Hackerspaces (or "makerspaces") can be found in more commercial forms, but the vast majority of spaces are self-organized and not-for-profit. For example, the OmniCorp hackerspace operates off member fees to cover rent and new equipment, from laser cutters to welding tools. OmniCorp also hosts an "open hack night" every Thursday in which the space is open to the general public. Potential members are required to attend at least one open hack night prior to a consensus vote by the existing members for admittance; no prospective members have yet been denied.

A visit to one of OmniCorp's open hack nights reveals the vast variety of activity and energy existing in the space. In the main common room alone, activities range from experimenting with sound installations and

learning to program Arduino boards to building speculative "loid" shapes – all just for the sake of it. With a general atmosphere of mutual support, participants in the space are continually encouraged to help others.

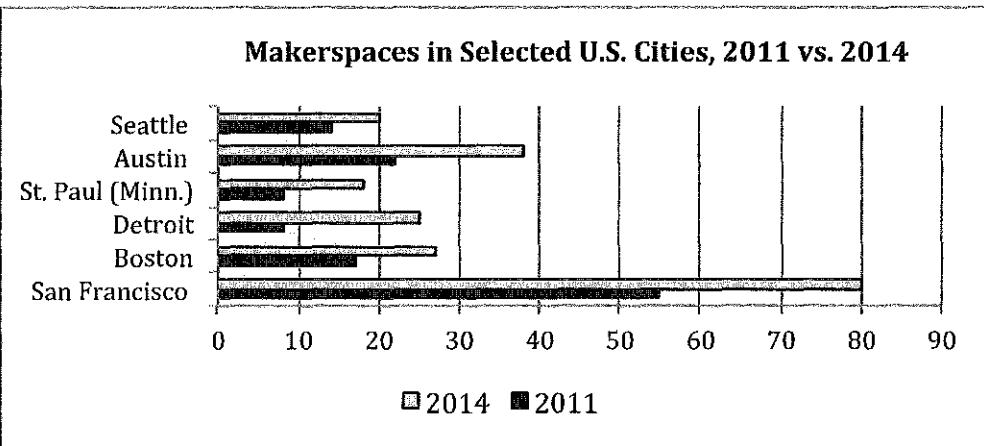
One of the most active community-focused initiatives in the city is the Mt. Elliot Makerspace. Jeff Sturges, former MIT Media Lab Fellow and Co-Founder of OmniCorp, started the Mt. Elliot project with the aim of replicating MIT's Fab Lab model on a smaller, cheaper scale in Detroit. "Fab Labs" are production facilities that consist of a small collection of flexible computer-controlled tools that cover several different scales and various materials, with the aim to make "almost anything" (including other machines). The Mt. Elliot Makerspace now offers youth-based skill development programs in eight areas: Transportation, Electronics, Digital Tools, Wearables, Design and Fabrication, Food, Music, and Arts. The range of activities is meant to provide not only something for everyone, but a well-rounded base knowledge of making to all participants.

While the center receives some foundational support, the space also derives significant support from the local community. Makerspaces throughout the city connect the space's youth-based programming directly to school curriculums.

The growing interest in and development of hacker/makerspaces has been explained, in part, as a result of the growing maker movement. Through the combination of cultural norms and communication channels from open source production as well as increasingly available technologies for physical production, amateur maker communities have developed in virtual and physical spaces.

Publications such as *Wired* are noticing the transformative potential of this emerging movement and have sought to devote significant attention to its development. Chief editor Chris Anderson recently published a book entitled *Makers*, in which he proclaims that the movement will become the next Industrial Revolution. Anderson argues such developments will allow for a new wave of business opportunities by providing mass-customization rather than mass-production.

The transformative potential of these trends goes beyond new business opportunities or competitive advantages for economic growth. Rather, these trends demonstrate the potential to actually transform economic development models entirely.



1 According to the graph, which statement is true about the number of makerspaces in Austin in 2014?

- A) It was smaller than the number of makerspaces in Detroit in 2014.
- B) It was almost half the number of makerspaces in San Francisco the same year.
- C) It was the same as the number of makerspaces in Austin in 2011.
- D) It lagged behind the number of makerspaces in Boston in 2014.

2 The author of the passage would most likely regard the graph with

- A) enthusiasm, because it demonstrates that makerspaces can revolutionize the United States economy.
- B) skepticism, because it shows a relatively small number of makerspaces in Detroit.
- C) approval, because it indicates that the makerspace movement has grown across the United States.
- D) hostility, because it reveals that San Francisco has the greatest number of makerspaces.

3 Which of the following statements from the passage is supported by information in the graph?

- A) Lines 3-6 (“In...makers”)
- B) Lines 26-29 (“Of...experimentation”)
- C) Lines 71-73 (“While...community”)
- D) Lines 94-96 (“The transformative...growth”)

6. The following passage is adapted from Julian Jackson, "New Research Suggests Dinosaurs Were Warm-Blooded and Active" © 2011 by Julian Jackson.

New research from the University of Adelaide has added to the debate about whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Professor Roger Seymour from the University's School 5 of Earth & Environmental Sciences has applied the latest theories of human and animal anatomy and physiology to provide insight into the lives of dinosaurs.

Human thigh bones have tiny holes – known as the 10 "nutrient foramen" – on the shaft that supply blood to living bone cells inside. New research has shown that the size of those holes is related to the maximum rate that a person can be active during aerobic exercise. Professor Seymour has used this principle to evaluate 15 the activity levels of dinosaurs.

"Far from being lifeless, bone cells have a relatively high metabolic rate and they therefore require a large blood supply to deliver oxygen. On the inside of the bone, the blood supply comes usually from a single 20 artery and vein that pass through a hole on the shaft – the nutrient foramen," he says.

Professor Seymour wondered whether the size of the nutrient foramen might indicate how much blood was necessary to keep the bones in good repair. For 25 example, highly active animals might cause more bone 'microfractures,' requiring more frequent repairs by the bone cells and therefore a greater blood supply. "My aim was to see whether we could use fossil bones of dinosaurs to indicate the level of bone metabolic rate 30 and possibly extend it to the whole body's metabolic rate," he says. "One of the big controversies among paleobiologists is whether dinosaurs were cold-blooded and sluggish or warm-blooded and active. Could the size of the foramen be a possible gauge for dinosaur 35 metabolic rate?"

Comparisons were made with the sizes of the holes in living mammals and reptiles, and their metabolic rates. Measuring mammals ranging from mice to elephants, and reptiles from lizards to crocodiles, one 40 of Professor Seymour's Honors students, Sarah Smith, combed the collections of Australian museums, photographing and measuring hundreds of tiny holes in thigh bones.

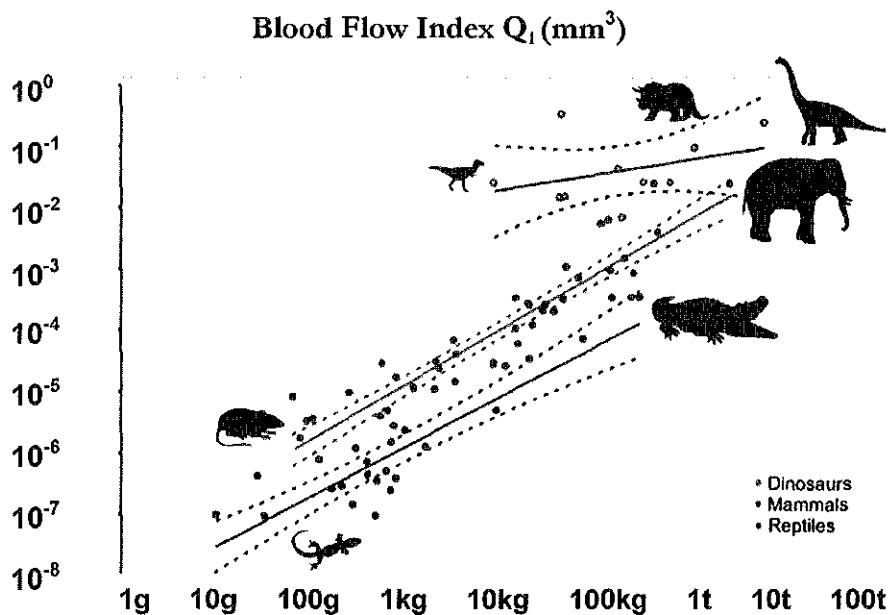
"The results were unequivocal. The sizes of the holes 45 were related closely to the maximum metabolic rates during peak movement in mammals and reptiles," Professor Seymour says. "The holes found in mammals were about 10 times larger than those in reptiles."

These holes were compared to those of fossil 50 dinosaurs. Dr. Don Henderson, Curator of Dinosaurs from the Royal Tyrrell Museum in Alberta, Canada, and Daniela Schwarz-Wings from the Museum für Naturkunde Humboldt University Berlin, Germany measured the holes in 10 species of 55 dinosaurs from five different groups, including bipedal and quadrupedal carnivores and herbivores, weighing 50kg to 20,000kg.

"On a relative comparison to eliminate the differences in body size, all of the dinosaurs had 60 holes in their thigh bones larger than those of mammals," Professor Seymour says.

"The dinosaurs appeared to be even more active than the mammals. We certainly didn't expect to see that. These results provide additional weight to 65 theories that dinosaurs were warm-blooded and highly active creatures, rather than cold-blooded and sluggish."

Professor Seymour says following the results of this study, it's likely that a simple measurement of 70 foramen size could be used to evaluate maximum activity levels in other vertebrate animals.



Seymour et al 2011

1 Which statement is best supported by data in the graph?

- A) Light reptiles have higher blood flow than heavier reptiles.
- B) Heavy mammals have lower blood flow than heavy reptiles.
- C) Blood flow in the heaviest mammals is slightly higher than in light dinosaurs.
- D) Blood flow is fairly uniform in dinosaurs at a wide range of weights.

2 The author of the passage would most likely consider the information in the graph to be

- A) a compelling piece of evidence in support of Professor Seymour's theory.
- B) a potentially interesting but premature finding.
- C) conclusive proof that dinosaurs were active and warm-blooded.
- D) suggestive of a point of view towards which the author is skeptical.

3 Do the data in the table provide support for Professor Seymour's claim that dinosaurs were warm-blooded and highly active?

- A) Yes, because they indicate that dinosaurs had foramen larger than the foramen of the largest mammals.
- B) Yes, because they suggest that dinosaurs had even higher metabolic rates than animals known to be warm-blooded.
- C) No, because they show that dinosaurs had lower blood flow than reptiles.
- D) No, because they reveal only minimal changes in metabolic rate between small and large dinosaurs.

# SAT® Vocabulary

*A New Approach*

Larry Krieger and Erica L. Meltzer

■ THE CRITICAL READER

New York

## Independent Practice: Set #1

1. This ability to judge the limits and capabilities of one's own memory is known as meta-memory, and a new study is shedding light on how this phenomenon works in the brain. Scientists now know that  
5 primates—and possibly other animals such as rats or birds—display some form of meta-memory ability. For example, a bird may choose to not waste time searching an area for food if it is more certain that food can be found in a different area. However, so far  
10 no one has been able to pinpoint what part of the brain is involved in this crucial process.

2. For the past two years, Stanford genetics professor Michael Snyder and his research team have been compiling the results from roughly 60 volunteers—himself included—who have been  
5 diligently tracking their bodies' behaviors through wearable biosensors. All those devices—some people wore half a dozen—collected more than 250,000 measurements a day on everything from heart rate to blood oxygen levels to skin temperature  
10 to physical activity to sleep patterns.

3. It seems obvious that a group of people with diverse individual expertise would be better than a homogeneous group at solving complex, nonroutine problems. It is less obvious that social diversity  
5 should work in the same way—yet the science shows that it does. This is not only because people with different backgrounds bring a variety of information and perspectives. Simply interacting with individuals who are different forces group members to prepare  
10 more deeply, to anticipate alternative viewpoints and to expect that reaching a consensus will take effort.

1 As used in line 3, “shedding light on” most nearly means  
A) adapting.  
B) disposing.  
C) revealing.  
D) shimmering.

2 As used in line 5, “tracking” most nearly means  
A) stalking.  
B) chasing.  
C) following.  
D) monitoring.

3 As used in line 10, “deeply” most nearly means  
A) thoroughly.  
B) distantly.  
C) abysmally.  
D) obscurely.

4. In those days, and later as a young man, I used to try to picture in my imagination the feelings and ambitions of a white boy with absolutely no limit placed upon his aspirations and activities. I used to envy the white boy who had no obstacles placed in the way of his becoming a Congressman, Governor, Bishop, or President by reason of the accident of his birth or race. I used to picture the way that I would act under such circumstances; how I would begin at the bottom and keep rising until I reached the highest round of success.

5. For millennia humans have gazed into the night sky and dreamed of traveling to the stars. Now that people have walked on the moon and lived in orbit on the space station, it seems inevitable that we will venture farther, to Mars, the rest of the solar system and beyond. The dream is common to many cultures and occupies the space agencies of nations around the world.

6. My mother was sitting by the fire, but poorly in health, and very low in spirits, looking at it through her tears, and desponding heavily about herself and the fatherless little stranger, who was already welcomed by some grosses of prophetic pins, in a drawer upstairs, to a world not at all excited on the subject of his arrival; my mother, I say, was sitting by the fire, that bright, windy March afternoon, very timid and sad, and very doubtful of ever coming alive out of the trial that was before her, when, lifting her eyes as she dried them, to the window opposite, she saw a strange lady coming up the garden.

7. Planetary scientists were surprised almost a decade ago when they discovered that the most plentiful types of meteorites they had collected and studied on Earth were actually not common in space. Now, a group of scientists has uncovered part of the explanation. Mineralogical evidence in some meteorites had already pointed to a cataclysmic collision in the asteroid belt long before dinosaurs, when multicellular animals were still fairly new.

4 As used in line 11, “round” most nearly means

- A) aspect.
- B) procession.
- C) rung.
- D) enclosure.

5 As used in line 6, “common to” most nearly means

- A) surrounded by.
- B) acceptable to.
- C) habitual in.
- D) shared by.

6 As used in line 2, “low” most nearly means

- A) stunted.
- B) gloomy.
- C) insignificant.
- D) minor.

7 As used in line 7, “pointed to” most nearly means

- A) suggested.
- B) preferred.
- C) gestured.
- D) diverted.

8. One January day, thirty years ago, the little town of Hanover, anchored on a windy Nebraska tableland, was trying not to be blown away. A mist of fine snowflakes was curling and eddying about the cluster  
5 of low drab buildings huddled on the gray prairie, under a gray sky. The dwelling-houses were set about haphazard on the tough prairie sod; some of them looked as if they had been moved in overnight, and others as if they were straying off by themselves,  
10 headed straight for the open plain.

9. It took hundreds of millions of years to produce the life that now inhabits the earth eons of time in which that developing and evolving and diversifying life reached a state of adjustment and balance with its  
5 surroundings. The environment, rigorously shaping and directing the life it supported, contained elements that were hostile as well as supporting. Certain rocks gave out dangerous radiation; even within the light of the sun, from which all life draws its energy,  
10 there were short-wave radiations with power to injure.

10. [Miss Bates] was a happy woman, and a woman whom no one named without good-will. It was her own universal good-will and contented temper which worked such wonders. She loved every body, was  
5 interested in every body's happiness, quicksighted to every body's merits; thought herself a most fortunate creature, and surrounded with blessings in such an excellent mother, and so many good neighbours and friends, and a home that wanted for nothing. The  
10 simplicity and cheerfulness of her nature, her contented and grateful spirit, were a recommendation to every body, and a mine of felicity to herself.

8 As used in line 6, "set about" most nearly means  
A) enveloped.  
B) accumulated.  
C) arranged.  
D) ruined.

9 As used in line 9, "draws" most nearly means  
A) obtains.  
B) restricts.  
C) captivates.  
D) lures.

10 As used in line 9, "wanted for" most nearly means  
A) demanded.  
B) lacked.  
C) passed by.  
D) overlooked.

## Independent Practice: Set #2

1. Systemic pesticides can be absorbed through roots and leaves and distributed throughout an entire plant, including pollen and nectar. These pesticides can poison bees directly, but even low-level exposure to treated flowers can lead to damaging effects such as a compromised immune stem, altered learning, and impaired foraging, all of which have the result of making bees more vulnerable to infection.

2. [W]e are assembled to protest against a form of government existing without the consent of the governed—to declare our right to be free as man is free, to be represented in the government which we are taxed to support, to have such disgraceful laws as give man the power to chastise and imprison his wife, to take the wages which she earns, the property which she inherits...We have met to uplift woman's fallen divinity upon an even pedestal with man's. And, strange as it may seem to many, we now demand our right to vote according to the declaration of the government under which we live.

3. In tense situations, everything can change between beats of the heart. And, it's more than just the situation that changes—our own reaction to a potentially dangerous encounter can hang on something as simple as the contraction of our heart. In a small study, researchers from the United Kingdom looked at how participant's perception of a threat changed with the beating of their hearts. They found that people were more likely to exhibit a reaction based on fear when their hearts were pumping blood, as compared to the resting phase between heartbeats.

1

As used in line 5, “treated” most nearly means

- A) indulged.
- B) affected.
- C) improved.
- D) repaired.

2

As used in line 9, “even” most nearly means

- A) consistent.
- B) equal.
- C) parallel.
- D) proportional.

3

As used in line 4, “hang” most nearly means

- A) lean.
- B) bet.
- C) depend.
- D) focus.

4. Mr. Woodhouse was fond of society in his own way. He liked very much to have his friends come and see him; and from various united causes, from his long residence at Hartfield, and his good nature, from  
5 his fortune, his house, and his daughter, he could command the visits of his own little circle, in a great measure, as he liked. He had not much intercourse with any families beyond that circle; his horror of late hours, and large dinner-parties, made him unfit for  
10 any acquaintance but such as would visit him on his own terms.

4

As used in line 6, “command” most nearly means

- A) control.
- B) charge.
- C) prohibit.
- D) announce.

5. By using a new technique to study unhatched dinosaur embryo fossils, scientists determined that those embryos took twice as long to hatch as bird eggs of a similar size. The embryo of a large duck-billed dinosaur took at least six months to hatch, and the eggs of larger dinosaurs may have taken even longer. The long incubation times complicate thinking about dinosaur behavior. While some kinds of dinosaurs may have tended their eggs and young, for  
10 others the difficulty of remaining in one place for close to a year to watch buried eggs would have proven impossible.

5

As used in line 9, “tended” most nearly means

- A) abandoned.
- B) considered.
- C) drifted toward.
- D) looked after.

6. In fact, the only thing that appeared three-dimensional about Boori Ma was her voice: brittle with sorrows, as tart as curds, and shrill enough to grate meat from a coconut. It was with this voice that she  
5 enumerated, twice a day as she swept the stairwell, the details of her plight and losses suffered since her deportation to Calcutta after Partition. At that time, she maintained, the turmoil had separated her from a husband, four daughters, a two-story brick house, a  
10 rosewood almiri, and a number of coffer boxes whose skeleton keys she still wore, along with their life savings, tied to the free end of her sari.

6

As used in line 8, “maintained” most nearly means

- A) supplied.
- B) persevered.
- C) proclaimed.
- D) renewed.

7. In a famous series of experiments on obedience conducted by Stanford Professor Stanley Milgram in the early 1960s, subjects were kept innocent of the experiment's true purpose. Milgram cleverly informed participants that he was testing the effects of punishment on learning and memory. In reality, he was testing factors that promote obedience to a person who is perceived as a legitimate authority figure.

8. Numerous companies have embraced the open office—about 70% of US offices are open concept—and by most accounts, very few have moved back into traditional spaces with offices and doors. But research that we're 15% less productive, we have immense trouble concentrating and we're twice as likely to get sick in open working spaces, has contributed to a growing backlash against open offices.

9. As an apology for addressing you, fellow-citizens! we cannot announce the discovery of any new principle adapted to ameliorate the condition of mankind....We point to your principles, your wisdom, 5 and to your great example as the full justification of our course this day. That "all men are created equal": that "life, liberty, and the pursuit of happiness" are the right of all; that "taxation and representation" should go together; that governments are to protect, not to 10 destroy, the rights of mankind; that the Constitution of the United States was formed to establish justice, promote the general welfare, and secure the blessing of liberty to all the people of this country...are American principles and maxims, and together they 15 form and constitute the constructive elements of the American government. From this elevated platform, provided by the Republic for us, and for all the children of men, we address you. In doing so, we would have our spirit properly discerned.

7

As used in line 3, "innocent" most nearly means

- A) ignorant.
- B) aware.
- C) careless.
- D) convinced.

8

As used in line 1, "embraced" most nearly means

- A) encircled.
- B) seized.
- C) adopted.
- D) gripped.

9

As used in line 16, "elevated" most nearly means

- A) raised.
- B) lofty.
- C) formal.
- D) inflated.

10. Miss Brooke had that kind of beauty which seems to be thrown into relief by poor dress. Her hand and wrist were so finely formed that she could wear sleeves not less bare of style than those in which the  
5 Blessed Virgin appeared to Italian painters; and her profile as well as her stature and bearing seemed to gain the more dignity from her plain garments, which by the side of provincial fashion gave her the impressiveness of a fine quotation from the Bible—or  
10 from one of our elder poets—in a paragraph of today's newspaper.

10

As used in line 3, "finely" most nearly means

- A) solidly.
- B) rarely.
- C) ornately.
- D) charmingly.

## **Glossary of Common Second Meanings**

Account (for) – explain

Advantage – favorable trait (e.g. height is a natural advantage for volleyball)

Affect (v.) – to adopt (a behavior); affected (adj.) – behaving in an artificial/pretentious way

Afford – grant (e.g. an opportunity)

Air – demeanor (e.g. to carry yourself with an air of authority)

Arrangement – situation

Arrest – put a stop to (not just put handcuffs on a criminal)

Assume – take on responsibility for, acquire (e.g. to assume a new position)

Attending – accompanying (e.g. the benefits attending the new job)

Basic – essential, fundamental

Becoming (adj.) – fitting, flattering

Boost – improve, promote

Broad – worldly (e.g. a broad view of society)

Bulk – majority (e.g. to complete the bulk of an assignment)

Calculated – plotted out

Capacity – ability

Chance (v.) – attempt

Check – control (e.g. The vaccine checked the spread of the disease)

Clear – obvious, unmistakable

Coin (v.) – invent (e.g. coin a phrase)

Common – shared

Compromise (v.) – endanger or make vulnerable (e.g. to compromise one's beliefs)

Conditions – circumstances (e.g. conditions under which a chemical reaction could occur)

Constitution – build (e.g. a football player has a solid constitution)

Conviction – strong belief (noun form of convinced)

Couch (v.) – hide

Critical – essential, necessary

Curious – odd

Currency – acceptance, approval (of an idea)

Direct (v.) – guide

Discriminating – perceptive

Disposed – inclined

Distant – aloof, emotionally uninvolved

Doctor (v.) – tamper with, alter

Draw (v.) - attract

Economy - thrift (e.g. a writer who has an economical style is one who uses few words)

Embroider - falsify, make up stories about

Establish - demonstrate, confirm

Exchange (n.) - conversation

Execute - carry out

Exploit - make use of, take advantage of (does not carry a negative connotation)

Facility - talent for

Fair - equitable (e.g. the jury reached a fair decision)

Favor - promote (e.g. the laws of economics favor companies with the best products)

Fierce - intense

Fine - (1) keen, perceptive; (2) well-developed

Foil - to put a stop to (e.g. to foil a robbery)

Foundation - basis, underpinning

General - common (e.g. a general pattern of behavior)

Grand - imposing

Grave/Gravity - serious(ness)

Great - large

Handle - survive in (e.g. able to handle adverse conditions)

Harbor - To possess, hold (e.g. to harbor a belief in UFOs)

Hold - claim

Hold out - resist

Host - contain

Impression - appearance (e.g. an impression of great success)

Independent - separate (e.g. an independent variable)

Issue - outcome (e.g. superior organization led to a happy issue)

Magnitude - strength (e.g. the magnitude of a correlation between two variables)

Maintained - retained (e.g. the painting maintained its vibrant colors)

Manners - behaviors (e.g. when good manners promote good conduct)

Matter - issue (e.g. the decision came down to a matter of cost)

Modest - small, limited (e.g. a modest amount = a small amount)

Natural - inherent (e.g. the exile lacked a natural connection with his adopted country)

Nature - personality (e.g. a good-natured fellow)

Observe - follow (e.g. a law)

Open - accessible

Passion - enthusiasm (e.g. to have a great passion for one's hometown)

Peculiar (to) - unique, distinctive

Plastic/plasticity - able to be changed

Poor - weak (e.g. a performance)

Prescribed - given, ordered (e.g. a prescribed set of rules)

Provoke - elicit (e.g. a reaction)

Put (v.) - state, say

Qualify - provide more information or detail about

Raise (v.) - (1) rear (e.g. an animal); (2) elevate/uplift

Range - scope, series (e.g. a range of options)

Raw - unfiltered, original (e.g. raw materials were not available when the project began)

Realize - achieve (a goal)

Reconcile - bring together

Regular - even

Relate/Relay - pass on information, give an account of (a story)

Represent - constitute (e.g. the new weapons represented a significant threat)

Reservations - misgivings

Reserve - hold off on (e.g. to reserve judgment)

Ripple (v.) - spread

Ruffled - flustered, anxious (unruffled - calm)

Sap (v.) - drain (e.g. of energy)

Scour - search

Scrap (v.) - eliminate

Set - determine

Sheer - pure, simple

Shelve - reject or discard (e.g. an idea or proposal)

Simple - straightforward

Simply - merely (e.g. the planet was simply the largest yet discovered outside our solar system)

Sober - serious, modest

Sound - firm, stable, reliable, valid (e.g. a sound argument)

Spare, Severe - plain, unadorned

State - condition

Static - unchanging (i.e. in a state of stasis)

Station - rank

Scale - level

Spotting - identifying (e.g. spotting lies)

Steep - high (e.g. pay a steep price for fossil fuels)

Store (n.) - reserve

Styled - called (e.g. his home might be styled post-modern)

Sustain (v.) - withstand

System - method (e.g. a streamlined system for taking attendance)

Temper (v.) - moderate, make less harsh

Tied (to) - connected to

Track - follow

Train (v.) - fixate on (e.g. train one's eyes on something)

Trace - tiny amount (e.g. the miners failed to discover even a trace of gold)

True - genuine

Uniform - constant, unvarying

Unqualified - absolute

Upset (v.) - interfere with an expected outcome

Urge - advocate, be in favor of

Values - principles

Wake - aftermath

Want - lack

Weight - importance, merit (e.g. people attach weight to honorable behavior)

Yield - reveal (e.g. an experiment yields results)

## Natural and Social Science

Each science passage describes the aims, methods, and results of a scientific investigation. As a result, these passages and their accompanying questions all employ a distinctive vocabulary that focuses on the language of evidence and experimentation.

In the section below, we define 25 of these key words and illustrate how College Board test-writers use and test them. We will also provide helpful tips that will enable you to save time by going directly to the correct answer.

### 1. Hypothesis – a proposed insight or explanation

A **hypothesis** is a proposed insight that has not been tested or verified. Science passages typically begin with a **hypothesis** that is then revised, challenged, strengthened, and sometimes confirmed. In one passage, for example, chemical ecologists hypothesized that enhancing the scent of Texas gourd flowers would attract more desired squash bees while repelling unwanted striped cucumber beetles. To their surprise, squash bees were indifferent to the fragrance-enhanced blossoms. This unexpected finding forced the chemical ecologists to revise their **hypothesis**.

### 2. Empirical – derived from experiment and observation

**Empirical** evidence is data derived from experiments and observations rather than from abstract theories. The chemical ecologists described in the previous example tested their hypothesis by conducting a carefully controlled experiment in which they collected **empirical** data from 168 Texas gourd vines. Scientists are reluctant to accept a hypothesis when **empirical** information is not available. For instance, a passage on the Higgs Boson explains that the scientific community initially rejected Higgs's ideas because they rested on speculation and not on **empirical** evidence.

### 3. Central claim – primary assertion

College Board test-writers frequently use the phrase **central claim**. This phrase appears often in questions, which may ask you to identify a **central claim** supported by data in a table. Don't let this phrase confuse you. *Central* means "main" or "primary," and a *claim* is an argument. So a **central claim** = the main argument or hypothesis discussed in a passage.

### 4. Counterclaim – counterargument

A **counterclaim** is a counterargument made to rebut (argue against) a claim discussed previously in the passage. Science passages often include a **counterclaim** posed by a dissenting scientist—that is, a scientist who rejects the main theory discussed in the passage. For example, in a passage about the origins of tectonic plates, one geochemist contended that the rocks studied by other geochemists were too old and deformed to provide reliable data.

### 5. Hypothetical – theoretical, based on speculation

**Hypothetical** describes an idea or situation that only exists as a theoretical concept. For example, time travel is a **hypothetical** phenomenon: it could exist, but right now it is only possible in science fiction movies. Although they are not real, **hypothetical** situations can challenge scientists to explore new hypotheses about puzzling natural phenomena.

## **6. Irreconcilable – unresolvable**

What do celebrity magazines and SAT science passages have in common? Both frequently use the word **irreconcilable** to describe differences that cannot be resolved. Celebrity magazines often feature sensational accounts describing how **irreconcilable** differences are responsible for movie stars' breakups. SAT science passages provide scholarly accounts of seemingly **irreconcilable** hypotheses. For example, the passage about the Higgs Boson explained why the Higgs Field enabled physicists to reconcile two seemingly **irreconcilable** phenomena—that is, it explained why two seemingly contradictory phenomena could actually exist at the same time.

## **7. Context – the setting or background information**

**Context** refers to the setting or frame of reference necessary to understand a topic. Knowing the context enables you to place an issue in a broader perspective. Our examination of the released tests reveals a surprising and helpful pattern: there is a 50 % chance that your Reading Test will include an answer choice featuring the word **context**. So far, there is a 90% chance that this choice will be the correct answer!

## **8. Consensus – general agreement**

A **consensus** is a general agreement about an idea or theory. Science passages often begin with a hypothesis that enjoys a widespread **consensus**. For example, in one passage we learn that neuroscientists long believed that the adult human brain was incapable of spawning new neurons. However, a groundbreaking study of London taxi drivers revealed that this **consensus** view was inaccurate.

## **9. Fundamental – basic and essential**

**Fundamental** is a frequently used descriptive word meaning “basic” or “essential.” For example, the phrase “the brain’s **fundamental** anatomical structure” describes the brain’s basic structure.

## **10. Yield – to produce or generate**

When you are driving, the word **yield** means “to give up the right of way.” But when you are reading an SAT science passage, **yield** means “to produce, provide, or generate.” For example, most science passages include a table that **yields** evidence that may support, modify, or even weaken a hypothesis.

## **11. Emphasize and Elaborate – to stress and fully develop**

The phrase **emphasize** and **elaborate** is often used to summarize research findings. **Emphasize** means “to accentuate or single out,” and **elaborate** means “to develop additional details.” A scientist who **emphasizes** and **elaborates** on a hypothesis will often clarify what was initially a puzzling finding.

## **12. Underscore – to emphasize**

Has one of your teachers ever written a key term on the whiteboard and then emphatically drawn a line under it? If so, you have witnessed a dramatic and hopefully effective illustration of why **underscore** means “**emphasize**.” It is important to note that SAT science passages rarely include an **underscored** word or phrase. However, they sometimes include an **italicized** word or phrase that is intended to **underscore** a key fact, idea, or claim.

**13. Undermine** – to weaken or damage

Look closely at the word **undermine**. It literally means, “to dig under a mine and therefore weaken it.” A scientist who **undermines** a hypothesis or argument is attempting to weaken it. For example, experimental data can sometimes be used to **undermine** a claim.

**14. Detrimental** – very harmful

The prefix DE- signals that **detrimental** is a negative word describing a situation or action in which things are literally going down. In fact, **detrimental** means “going down” in the sense of causing damage or harm. For example, in one passage proponents of organic farming argue that conventional agriculture produces fruits and vegetables that are **detrimental** to the environment. (Note: In the past, SAT prep books recommended that students learn long lists of prefixes. Our analysis reveals that this is no longer necessary. So far, DE- is the only prefix you need to know.)

**15. Optimistic** – confident of a positive outcome; **Pessimistic** – confident of a negative outcome

**Optimistic** is a straightforward word that always describes a hopeful, confident, and even cheerful outlook. For example, a passage on the solar panel industry highlighted the work of leading researchers who are **optimistic** about the long-term prospects of using solar panels to lower energy costs. It is important to note that not all solar panel experts are **optimistic**. The passage also noted that some experts are **pessimistic**, or discouraged, because weak market conditions are eroding profits and slowing innovation.

**16. Incongruous** – incompatible, obviously inconsistent with a particular situation

What do a New York Yankees baseball hat, a Boston Red Sox jacket, and the planet Jupiter have in common? They all illustrate the word **incongruous**. Let us explain: Larry often wears his favorite Yankees baseball hat AND his favorite Boston Red Sox jacket. This **incongruous** combination confuses people who point out that the two teams are bitter rivals. How can he simultaneously be a fan of the Yankees and the Red Sox? Although the combination is indeed **incongruous**, the hat and the jacket are comfortable, and that is all that matters to him. Planetary astronomers are not concerned with **incongruous** sportswear, but they are concerned with **incongruities** in space. For example, planetary scientists in one recent passage noted the **incongruity** between their knowledge of water on distant planets and their lack of knowledge about the amount of water on nearby Jupiter. The **incongruity** is explained by the fact that Jupiter is so cold that all the water sinks into the planet, far out of sight.

**17. Enumerate** – to list

**Enumerate** literally means to “numerate” or number things in a list. For example, in the *Declaration of Independence*, Thomas Jefferson enumerates a long list of colonial grievances (complaints) against King George III. While SAT science passages do not enumerate grievances, they often do **enumerate** the advantages of a program or innovation. For example, the author of the passage about solar panels enumerated several advantages of this new technology.

**18. Tentative** – undecided, not certain

**Tentative** means “undecided.” Science passages often use moderating words and phrases such as *perhaps* and *at first glance* to indicate that a theory is **tentative**. For example, a passage about the duckbill dinosaur indicates that paleontologists initially expressed a **tentative** understanding of the function of this prehistoric creature’s distinctive but puzzling head ornamentation.

**19. Analogy – a comparison between two dissimilar ideas or objects**

Science writers are frequently faced with the problem of describing very abstract concepts. They often solve this problem by using **analogies** to compare unfamiliar ideas or objects to familiar ones. For example, one writer faced the difficult task of describing how the Higgs field exerts a drag force on particles when they accelerate through the field. The author used a clever but simple **analogy** in which he asked readers to “think of a ping pong ball submerged in water.” He then pointed out that if you push on the ping pong ball, it “will feel much more massive than it does outside of water.”

**20. Analogous – characterized by a parallel similarity**

**Analogous** is the noun form of *analogy*. It is used to describe two similar situations between which a comparison can be drawn. For example, one challenging question asked test-takers to use a graph to identify a historic example in the mid-1980s that was “most analogous to” a hypothetical situation in another time period. Simply stated, this question asked students to identify a condition or scenario that was most similar to an event in the mid-1980s.

**21. Approximation – an estimate**

Although scientists strive to be as exact as possible, they nonetheless must often begin with an **approximation**, or estimate. For example, in a comparative study of dogs and wolves, scientists initially speculated that wolves raised by humans would demonstrate social-cognitive skills approximating those of dogs raised by humans.

**22. Innate – inborn**

The scientists who studied the social-cognitive differences between dogs and wolves (see above) ultimately concluded that **innate** or **inborn** differences account for many of the different behaviors between the two species.

**23. Underlying Assumption – a basic belief that is not directly stated**

**Underlying** literally refers to something lying beneath something else; however, the word **underlying** can have a subtler meaning. In SAT science passages, an **underlying assumption** refers to a basic belief that is present but not directly stated in the passage. For example, the **underlying assumption** in a study of dogs and wolves was that innate genetic differences would account for the difference in their behaviors.

**24. Haphazard – random**

If you look at the nighttime sky, the stars and galaxies appear to be spread across the heavens in a **haphazard**, or random, manner. However, some astronomers have recently begun to question this long-held assumption. In a recent science passage, Margaret Geller contends that advanced maps of the universe reveal a remarkable pattern resembling a giant stickman.

**25. Adept – very skillful**

What do the fictional superhero Captain America and the scientists in a typical SAT Reading Test passage have in common? Both are very **adept**, or skillful, at accomplishing their goals. Captain America is **adept** at defeating villains who want to overwhelm the Avengers and conquer Earth. The scientists featured in SAT science passages are very **adept** at formulating and testing hypotheses.

## Historical Documents

SAT Reading Tests always include passages drawn from significant historical documents ("The Great Global Conversation"). These passages focus on questions of freedom, justice, and human rights, and they consist of excerpts from well-known articles and speeches by both American and international authors. These excerpts are often combined into dual passages, which frequently present conflicting points of view on a topic. These passages also contain a very distinctive vocabulary. All 15 of the following words have generated answers on recent tests.

### 26. Subordinate – lower in rank, occupying an inferior position

Look closely at the word **subordinate**. SUB- means "lower" or "under," and ORDINATE refers to an order of things. So subordinate describes a lower or inferior position. In an essay published in 1837, Catherine Beecher argued, "Heaven has appointed to one sex the superior, and to the other the **subordinate station**." It is important to note that although Beecher believed that women occupy a "subordinate relation" to men, she also argued that women could play a significant role in society by exerting influence within their homes and families.

### 27. Station – position or rank

What do you think of when you hear the word **station**? Most people would probably respond by saying "a gas station" or "a train station." While station can refer to a stopping place for cars and trains, it can also refer to a position or rank someone occupies in society. In the example above, Catherine Beecher argues that women are assigned a subordinate station, or lower rank.

### 28. Peculiar – distinctive

The word **peculiar** normally refers to unusual or strange behavior. It can even describe an odd odor. During the nineteenth century, authors like Catherine Beecher used **peculiar** to mean "distinctive." That is why she wrote that the power of women "should be altogether different and **peculiar**" from that of men." It is also interesting to note that Southern defenders of slavery referred to the practice as "our peculiar institution." In their view, the word **peculiar** did not mean odd or strange. Instead, it referred to something distinctive about or characteristic of the Southern way of life.

### 29. Sarcastic – using irony to mock or convey contempt

Richard Price was a British political philosopher who criticized King George III's decision to use force to subdue the thirteen North American colonies. In an essay excerpted by the College Board, Price scornfully points out that the King and Parliament have convinced themselves that the colonists will be "much happier under our government than under any government of their own." He then sarcastically asks, "How kind is it thus to take upon us the trouble of judging for them what is most for their happiness?" The word *kind* conveys Price's **sarcastic** or mocking tone.

### 30. Degrade – to deteriorate, to lower in dignity

As we have noted in Word #14 above, the prefix DE- signals that things are going down. **Degradation** means "deteriorate" in the sense of lowering in quality or value. In a passage about the social and political roles of men and women, the nineteenth century French writer Alexis de Tocqueville contended that by "attempting to make one sex equal to the other, both are **degraded**." He goes on to insist that this will produce "weak men and disorderly women." Your knowledge of **degraded** should enable you to conclude that de Tocqueville believed that extending political and social rights to women would harm both sexes.

### 31. Entrenched – deeply established

The College Board did not allow de Tocqueville's views to stand uncontested. De Tocqueville's passage was part of a dual reading that also included a passage by the British philosopher Harriet Taylor Mill. A contemporary of de Tocqueville, Mill contended that inequality had been deeply entrenched, or long established, for generations. **Entrenched** literally means "to surround by a strong defensive trench." When Mill wrote in the early 1850s, both women and enslaved Africans faced deeply entrenched systems of inequality.

### 32. Tenacious – persistent and determined

Harriet Mill was not a naïve idealist. She recognized that the strong emotions surrounding existing social roles would be **tenacious** and was thus persistent and determined in her defense of women's equality.

### 33. Dominion – supremacy

**Dominion** means "characterized by supremacy and dominance." Harriet Mill argued for "a just equality instead of what she called "the **dominion**" of the strongest. She believed that gender roles would change because of an ongoing social shift toward greater equality. This inevitable movement would enable both men and women to achieve their full potential.

### 34. Revere – to show deep respect

Cesar Chavez is now revered as an iconic American labor leader and civil rights activist. The deep respect for Chavez can be seen in the many schools, streets, and parks named after him. The College Board recognized America's great respect for Chavez by devoting a dual passage to his role in leading the historic Delano strike.

### 35. Disparity – inequality

Look closely at the word **disparity**. The Latin root PAR- means "equal." That's why when golfers are par for a course, they are literally equal to the course. So **parity** means "equal to." In contrast, **disparity** signals an inequality. Led by Cesar Chavez, farm workers in California protested the **disparity** between the working conditions of nonunion farm workers and unionized industrial workers.

### 36. Antagonism – strong opposition

Chavez recognized that the farm workers faced a long and uphill struggle. A deep **antagonism**, or strong opposition, divided the farm workers and the growers. Influenced by Martin Luther King, Chavez believed that non-violent protests would garner national support and eventually erode the antagonism between the farm workers and the growers.

### 37. Repudiate – to reject

Should you always obey the law? The College Board explored this issue in a dual passage containing excerpts from writings by Abraham Lincoln and Henry David Thoreau. Lincoln contended that allowing people to break laws would **repudiate**, or reject, America's core value of respect for the law. However, Lincoln did not say that there are no unjust laws. He emphasized that "bad laws" should be followed until they are changed by "proper legal provisions."

38. Advocate – to publicly recommend, to urge

Lincoln's policy of restraint (see Word #37) did not convince Henry David Thoreau. Thoreau advocated, or urged, that his fellow Americans break any law forcing them to be "the agent of injustice."

39. Discredited - damaged and disgraced

The renowned African American abolitionist leader Frederick Douglass applied Thoreau's critique of unjust laws to slavery. In a famous speech excerpted by the College Board, Douglass argued that slavery was a discredited, or disgraced, institution because it violated America's principles of liberty, justice, and equality.

40. Populist – a person who identifies with ordinary people

American history contains a number of noteworthy examples of populists who identified with the concerns of ordinary people. In a dual passage, the College Board featured an 1828 Independence Day address delivered by Francis Wright. The speech emphasized that Wright was a populist who eloquently expressed her "love of the public good" and her "preference for the interests of the many to those of the few."

## American and World Literature

In the past, literature passages often tested rhetorical devices such as paradox, personification, and metaphorical language. Thus far, the new SAT has not tested your knowledge of this type of vocabulary. Instead, questions focus on vocabulary in context (see Chapter 1), comprehension, and descriptive words and phrases. The section will define and illustrate how 10 vocabulary words and phrases have been used on recent exams.

### 41. Earnest – marked by deep sincerity and serious intent

How can you determine whether someone has an *earnest* attitude? In his song “Watcha Say,” Jason Derulo readily acknowledges that he should have treated his girlfriend better. He then earnestly begs her to “give me another chance to be your man.” SAT Reading Test passages are subtler than Jason’s heartfelt plea. For example, in an excerpt from the novel *Portrait in Sepia*, we meet a young girl who is bright but aimless. She then receives a beautiful Kodak camera. The young girl tells us, “I picked it up with reverence.” The word *reverence* (see Word #34) means “great respect.” This signals the young girl’s *earnest* interest in learning how to use her new camera.

### 42. Indifferent – characterized by a lack of interest or concern

*Indifferent* characters are easily recognized by their lack of interest in a topic. For example, in the short story “Nawabdin Election,” the laborer Nawabdin comes to his boss, K.K. Harouni, to explain that he is no longer able to ride his bicycle as easily as he could as a younger man. The narrator states that Harouni “didn’t particularly care one way or the other, except that it touched on his [own] comfort.” In other words, Harouni was largely *indifferent* to Nawabdin’s plight.

### 43. Diligent – careful and conscientious

*Diligent* describes someone who is careful and conscientious. It is a trait that employers value. But how can an employee demonstrate that he or she is *diligent*? To return to the example of “Nawabdin Election,” the hardworking Nawabdin devises a clever way to prove to his boss that he is indeed a *diligent* worker. Rather than reciting a list of his accomplishments, Nawabdin bows his head, revealing a collection of gray hairs. The demonstration works, and the boss awards Newabdin a highly prized new motorcycle.

### 44. Dismissive – showing disregard and a lack of interest

Body language can provide a revealing insight into someone’s true feelings. For example, in *Brewster: A Novel*, a track coach admonishes a novice runner named Mosher to pace himself and avoid “doing anything stupid.” But eager to prove himself to his teammates, Mosher just shrugs his shoulders. The description of Mosher’s body language underscores his *dismissive* attitude towards his coach’s advice.

### 45. Arrant – complete and total

*Arrant* is an adjective that intensifies the word it modifies. For example, *arrant nonsense* means “total nonsense.” In *The Amazing Adventures of Kavalier & Clay*, the narrator describes a pivotal moment when Rosa Saxon suddenly understands “the true horror of her destiny, the *arrant* purposelessness of her life.” The use of *arrant* emphasizes the emptiness in Rosa’s life.

**46. Flush - a sudden rush of intense emotion**

Flush typically describes a cleaning action that uses water. For example, ophthalmologists flush your eyes, and everyone has flushed a toilet. However, flush can also be used to describe a sudden rush of intense emotion. For example, in the passage described in Word #45, Rosa Saxon accepts a proposal to become a full-time cartoonist "with a flush of gratitude." The phrase "flush of gratitude" provides a vivid way of conveying Rosa's excitement at beginning a new career.

**47. Vitality - filled with energy**

What do the British-American rock band Katrina and the Waves and the fictional character Eppie in George Eliot's novel *Silas Marner* have in common? Both exhibit a distinctive energy and vitality. Katrina enjoys a special feeling of "walking on sunshine" when she is with her boyfriend. Eppie is an adorable child who delights in "loving sunshine and living sounds." On a recent SAT, these traits clearly supported linking Eppie with the word vitality.

**48. Despondent - very sad and discouraged**

Despondent describes a feeling that is very different than the exuberant vitality exhibited by young Eppie Marner (see Word #47). The prefix DE- signals that this is a "down" word. In his classic song "What Becomes of the Broken-hearted?" a despondent Jimmy Ruffin describes himself as "filled with sadness" as he asks, "What becomes of the broken-hearted, who had love that's now departed?" SAT literary passages sometimes include characters who, like Jimmy Ruffin, feel despondent because they have suffered great losses.

**49. Mar - to spoil and thus render less perfect**

Mar is a straightforward negative word meaning "to spoil or damage and thus render less perfect." For example, Mark Zuckerberg's neighbors on the Hawaiian island of Kauai are accusing the Facebook founder of building a six-foot high wall that is marring their view of the Pacific Ocean. It is a long way from Mark Zuckerberg's wall to an illustration of mar on a recent Reading Test. The exam began with an excerpt from *The Emperor of Ocean Park* by Stephen L. Carter. The narrator opens his story by telling us that his sister Mariah was "touchingly devoted to the impossible work of gaining their [parents'] approval." The key phrase "impossible work" provides evidence that Mariah's relationship with her parents is marred by their excessive demands.

**50. Solemn - serious and dignified**

Have you ever attended a funeral? If so, then you know that the mood is solemn, or serious and dignified. A recent Reading Test passage described callers at the funeral as being "formal and sober." This phrase provides evidence that the funeral was a solemn event.

## A Sophisticated Game of Verbal Matching

Since correct answers are restatements of information from the passage, your job is to match key ideas from the text with their accurate restatements in each set of answers. In effect, the College Board is asking you to play a sophisticated game of verbal matching. The exercises below are designed to help you begin the process of recognizing the types of paraphrases you will encounter on the Reading Test.

In the following two exercises, match the passage phrases in the left column with answer restatements in the right column.

### Practice Set #1

1. _____ insufficient support	A. scattered haphazardly
2. _____ it had long been thought	B. weak evidence
3. _____ hopeful about the future	C. little empirical basis
4. _____ extensive speculation	D. question a consensus
5. _____ distributed at random	E. optimistic going forward

### Practice Set #2

1. _____ remain tentative	A. necessarily innate
2. _____ retard commerce	B. open people's thoughts
3. _____ attributable to genetics	C. great disparities
4. _____ immense distance	D. endanger economic prosperity
5. _____ enlarge all minds	E. still unsettled

### **Practice Set #3**

- |                                   |                                |
|-----------------------------------|--------------------------------|
| 1. _____ familiar scenery         | A. no evidence of civil unrest |
| 2. _____ absence of public tumult | B. allow for suppleness        |
| 3. _____ financial incentives     | C. predictable view            |
| 4. _____ pin down a problem       | D. economic motives            |
| 5. _____ permit flexibility       | E. resolve a puzzle            |

### **Practice Set #4**

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| 1. _____ evolve from separate events | A. develop from divergent lines |
| 2. _____ lust for revenge            | B. inflate the significance     |
| 3. _____ illusion of importance      | C. answer remains elusive       |
| 4. _____ no accepted explanation     | D. desire for retribution       |
| 5. _____ established feeling         | E. entrenched emotion           |

## Evidence-Based Pairs: Independent Practice

The following full-length passage will give you an opportunity to apply our three-step process to two sets of Evidence-Based Pairs.

William Foote Whyte's study of an impoverished Italian-American slum he called "Cornerville"—Boston's North End—is a classic of sociological research. Whyte lived and worked in

- 5 Cornerville during the final years of the Great Depression between 1937 and 1940. He later published his findings in a book titled *Street Corner Society*.

Whyte research relied almost entirely on the 10 method of participant observation. He did not pretend to study Cornerville's major institutions. Indeed, he scarcely mentioned the family, the church, the schools, and the legitimate sectors of the local economy. Instead, Whyte focused on mapping the 15 intricate social worlds of two associations in which he participated, a street corner gang called the Nortons and a small association called the Italian Community Club. The members of the Nortons were "corner boys" whose life revolved around particular street 20 corners and nearby shops. The members of the Italian Community Club were "college boys" who focused on getting a good education so they could move up the social ladder. The social distance between the 25 lives of the two groups was one of the major themes in Whyte's book.

*Street Corner Society* has a remarkable dramatic quality. Few other works in the sociological literature contain such vivid portrayals of real people in real situations. Much of this quality must be attributed to 30 Whyte's emotional involvement with the people he studied. The clarity of his extensive use of direct quotations provides the reader with a sense of personal involvement.

Whyte grew up in an affluent family that was far 35 removed from Cornerville. He nonetheless performed his task of being a participant observer so well that he did not seem out of place. He found a second home in the family of a local restaurant keeper, learned Italian, achieved high status in the Nortons, made friends with 40 the racketeers, worked in election campaigns, and even brought his new bride to live in Cornerville. Whyte sometimes forgot neutrality and took sides in local issues. For example, on one occasion he voted several times on election day. Critics have 45 complained that Whyte often lost his objectivity and sometimes turned from being a nonparticipating observer to being a nonobserving participant.

The best remembered of Whyte's findings is known as the bowling score effect. Bowling was one of 50 the Norton's principle activities. Sociologists had long held that an individual's skill in a sport would contribute to his or her status in the group. However, after an extensive observation of bowling competition, Whyte hypothesized that the reverse was actually true - 55 the status of a group member determined his or her bowling skill. This was particularly true on those occasions when the entire group assembled for an important match. Subtle and overt group pressures were deliberately used to depress the performance of 60 lower-ranking group members. At the same time, positive group pressures were employed to sustain the performance of the leaders. Whyte vividly reported this phenomenon in one of his most quoted passages:

*Here was the social structure in action on the 65 bowling alleys. It held the individual members in their places—and I along with them. I did not stop to reason then that, as a close friend of Doc, Danny, and Mike, I held a position close to the top of the gang and therefore should be expected to excel on this great 70 occasion. I simply felt myself buoyed up by the situation. I felt my friends were for me, had confidence in me, wanted me to bowl well. As my turn came and I stepped up to bowl, I felt supremely confident that I was going to hit the pins that I was aiming at. I have 75 never felt quite this way before—or since. Here at the bowling alley I was experiencing subjectively the impact of the group structure upon the individual. It was a strange feeling, as if something larger than myself was controlling the ball as I went through my 80 swing and released it toward the pins.*

Although Whyte was not an outstanding bowler, he won the tournament for the Nortons. His insights into the positive and negative effects of group performance have influenced subsequent sociological 85 studies.

1

- The author most directly stresses which point about the inequalities of life in Corncerville?
- A) The obvious lack of social cohesion.
  - B) The detrimental effect of a corrupt political system.
  - C) The disparity between the lives of two principal social groups.
  - D) The pervasive feeling of pessimism caused by difficult economic conditions.

2

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 4-6 ("Whyte lived...1940")
- B) Lines 23-25 ("The social ...book")
- C) Lines 34-35 ("Whyte grew...Corncerville")
- D) Lines 43-44 ("For example...day")

3

According to the passage, the bowling score effect is significant because it

- A) called into question an earlier consensus.
- B) demonstrated flaws in the participation observation method.
- C) provided evidence for a popular viewpoint.
- D) illustrated the underlying social antagonisms in Corncerville.

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 48-49 ("The best...effect")
- B) Lines 50-56 ("Sociologists...skill")
- C) Lines 56-58 ("This...match")
- D) Lines 58-62 ("Subtle...leaders")