

English/Reading  
Version

**Form C01**

(July 2020)



The **ACT**<sup>®</sup>

2019|2020

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If you wish to order a photocopy of your scanned answer document—including, if you took the writing test, a copy of your written essay—please use the order form on the inside back cover of this booklet.





## ENGLISH TEST

45 Minutes—75 Questions

**DIRECTIONS:** In the five passages that follow, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for the underlined part. In most cases, you are to choose the one that best expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is best, choose "NO CHANGE." In some cases, you will find in the right-hand column a question about the underlined part. You are to choose the best answer to the question.

You will also find questions about a section of the passage, or about the passage as a whole. These questions do not refer to an underlined portion of the passage, but rather are identified by a number or numbers in a box.

For each question, choose the alternative you consider best and fill in the corresponding oval on your answer document. Read each passage through once before you begin to answer the questions that accompany it. For many of the questions, you must read several sentences beyond the question to determine the answer. Be sure that you have read far enough ahead each time you choose an alternative.

## PASSAGE I

## A Mouthful of Music

*Mouth music* is the name given in English to the many ways by imitating the sounds of musical instruments with the human voice. Forms of mouth music are performed around the world, but the genre being particularly popular in England, Ireland, and Scotland. In this Celtic region, *lilting* and *jigging* are two of the lively names used to refer to this musical form.

Celtic mouth music exists to accompany dancing, so the rhythms and sounds are first-class and the words take a back seat. Instead of using traditional lyrics, singers often produce nonsense syllables, called vocables to represent specific instrumental sounds, such as those of bagpipes or violins. The results are songs that rarely make literal sense but nevertheless flow in a way easier to dance to.

1. A. NO CHANGE  
B. with  
C. of  
D. at
2. F. NO CHANGE  
G. was being  
H. is  
J. DELETE the underlined portion.
3. A. NO CHANGE  
B. more important than the lyrics.  
C. a bigger deal than the words.  
D. way more vital than verse.
4. F. NO CHANGE  
G. syllables called vocables,  
H. syllables, called vocables,  
J. syllables called, vocables,
5. A. NO CHANGE  
B. easily  
C. that is easy  
D. DELETE the underlined portion.

One Scottish form of mouth music, *puirt-a-beul*, is performed entirely in the Gaelic language and accompanies traditional dance steps. The often tongue-twisting lyrics require much practice to perfect. The greater challenge for

many *puirt-a-beul* singers, though, is learning when to breathe. A poorly timed breath might break a song's flow, interrupting the steady beat it relies on to help time their steps.

9 Instruments were prohibitively expensive and

thus scarce in isolated Scottish villages in order to fill the void, mouth music emerged and provided residents with the music they wanted for dancing. Additionally, *puirt-a-beul* gave anyone whomever didn't read music a way to learn and pass on traditional songs.

The continuing popularity of Celtic mouth music is testament to the vitality of them. In the 1990s, groups like Mouth Music from Scotland and The Cranberries from Ireland rose to fame, exposing with audiences Celtic mouth music worldwide.

6. If the writer were to delete the underlined portion, the sentence would primarily lose:
- F. a description that emphasizes the difficulty of *puirt-a-beul*.
  - G. information about writing lyrics for *puirt-a-beul* music.
  - H. an indication of how often *puirt-a-beul* is performed in the Celtic culture.
  - J. an example of a training exercise *puirt-a-beul* singers use to practice lyrics.
7. A. NO CHANGE  
B. at the same time,  
C. this time,  
D. still,
8. F. NO CHANGE  
G. dancers rely  
H. they rely  
J. relied
9. Given that all the following statements are true, which one, if added here, would most effectively introduce the subject of the paragraph?
- A. *Puirt-a-beul* was most likely invented out of necessity.
  - B. Mouth music singers must have a good sense of rhythm.
  - C. Celtic mouth music, including *puirt-a-beul*, has influenced jazz scat singing.
  - D. Another form of mouth music that originated in Scotland is the waulking song.
10. F. NO CHANGE  
G. villages and in  
H. villages. In  
J. villages, in
11. A. NO CHANGE  
B. which  
C. whom  
D. who
12. F. NO CHANGE  
G. this musical form.  
H. itself.  
J. one.
13. A. NO CHANGE  
B. exposing audiences worldwide to Celtic mouth music.  
C. for audiences worldwide exposing Celtic mouth music.  
D. worldwide exposing Celtic mouth music to audiences.

The bands' celebrity continually survives as they

14

combine traditional mouth music with modern rhythms.

15

14. F. NO CHANGE  
G. still remains and carries on  
H. stays sticking around  
J. endures
15. Given that all the choices are accurate, which one most effectively expresses the idea that the bands incorporate both classic Celtic music and current influences into their music?  
A. NO CHANGE  
B. continue to produce new music and release new albums.  
C. put on concerts around the world.  
D. sing and dance on stage.

PASSAGE II

Making the Desert Bloom

More than two thousand years ago, a people the Romans, called the Garamantes, created a complex civilization in one of the world's driest places—the Sahara Desert. Beginning around 500 BCE, they built towns and villages, cloth was manufactured there and jewelry, and traded throughout North Africa and the Mediterranean. They also grew a variety of crops, including wheat, dates, palms, grapes, figs, and melons. 18

The survival of their civilization depended on hundreds of miles of underground tunnels. These tunnels carried water to desert settlements from an aquifer, an underground water source, in the distant mountains. 19

The water ran through sloping, hand-dug tunnels called foggaras, which could be as deep as one hundred thirty feet below ground. These tunnels were connected to the surface by ventilation shafts every thirty feet or so.

16. F. NO CHANGE  
G. Romans called the Garamantes.  
H. Romans called: the Garamantes  
J. Romans called the Garamantes
17. A. NO CHANGE  
B. the manufacture of cloth took place  
C. manufactured cloth  
D. cloth
18. If the writer were to delete the preceding sentence, the paragraph would primarily lose a concluding statement that:  
F. suggests the Garamantes were successful farmers in that they grew a variety of crops.  
G. summarizes the information presented about the Garamantes.  
H. indicates the products that the Garamantes exported to Rome.  
J. takes the focus off the Garamantes and places it on the products they imported.
19. Which choice provides new information to the essay?  
A. NO CHANGE  
B. upon which they depended.  
C. used by the Garamantes.  
D. a key to their survival.
20. Which choice best indicates the method used to build the tunnels?  
F. NO CHANGE  
G. underground  
H. dimly lit  
J. desert

When the tunnels reached a town or field, the water flowed

into more easy accessible surface canals or reservoirs.

21

Having left no clues, archaeologists don't know how

22

the Garamantes learned to build foggaras. Other such tunnels exist in Iran, Algeria, Tunisia, and elsewhere.

Because the canals were underground, the water they carried stayed clean and didn't evaporate. And because the water came from an aquifer rather than from its rainfall,

23

the supply was unaffected by drought. The Garamantes

could of relied on a constant supply of water for drinking.

24

washing, and irrigation. Moreover, the cold, damp air of the foggaras lowered the temperature inside the homes that were built over them, resulting in an ancient form of air-conditioning.

25

The Garamantes who thrived until about 500 CE, when some archaeologists believe they began to deplete

26

the aquifer. As the foggaras supplied less and less water,

27

the Garamantes' population declined, their civilization eventually collapsed. However, at least six hundred of the ancient foggaras survive. The stone mounds that mark their ventilation shafts are still visible in what is now southwestern Libya, where they can be seen even now.

29

21. A. NO CHANGE

B. more easily

C. easier and

D. easy and

22. F. NO CHANGE

G. A genuine puzzle to scientists, archaeologists

H. Giving no indication, archaeologists

J. Archaeologists

23. A. NO CHANGE

B. than from

C. then

D. by

24. F. NO CHANGE

G. had to of relied

H. could rely

J. relies

25. A. NO CHANGE

B. Nevertheless,

C. In contrast,

D. Even so,

26. F. NO CHANGE

G. many of whom

H. having

J. DELETE the underlined portion.

27. A. NO CHANGE

B. As to when

C. Whereas

D. Though

28. F. NO CHANGE

G. declined the Garamantes'

H. declined. Their

J. declined their

29. A. NO CHANGE

B. a place where visitors can see these amazing signs of an ancient civilization.

C. the location that continues to present visitors with a view of these remnants of a time gone by.

D. DELETE the underlined portion and end the sentence with a period.

Question 30 asks about the preceding passage as a whole.

30. Suppose the writer's primary purpose had been to present information about a civilization's efforts to overcome a natural obstacle in order to survive. Would this essay accomplish that purpose?
- F. Yes, because it explains that the Garamantes traded throughout North Africa and the Mediterranean.
  - G. Yes, because it describes the Garamantes' method of bringing water to an otherwise dry area, allowing the Garamantes to thrive there.
  - H. No, because the foggaras were not naturally occurring tunnels.
  - J. No, because the foggaras ultimately led to the downfall of the Garamantes' civilization.

PASSAGE III

Neutrinos on Ice

At the IceCube Neutrino Observatory in Antarctica, eighty-six cables descend 2,500 meters down into the glacial terrain. Each cable is equipped with sixty digital optical modules (DOMs), which, are programmed, to detect a faint blue flash known as Cherenkov radiation.

This radiation: a veritable shock wave of photonic energy—is emitted when subatomic particles called neutrinos collide with electrons in the molecules of ice.

Although there are countless neutrinos in the universe (fifty trillion neutrinos pass through your body every second), actually detecting them is a formidable task. Neutrinos carry no electrical charge, are practically weightless, and travel at nearly the speed of light.

Neutrinos are rarely affected by matter or electromagnetic fields. For this purpose, many neutrinos have been traveling through space unimpeded for billions of years.

31. A. NO CHANGE  
B. down below  
C. downwards  
D. DELETE the underlined portion.
32. F. NO CHANGE  
G. (DOMs), which are programmed  
H. (DOMs): which are programmed  
J. (DOMs); which are programmed
33. A. NO CHANGE  
B. radiation—  
C. radiation;  
D. radiation
34. If the writer were to delete the underlined portion (adjusting the punctuation as needed), the essay would primarily lose information that:
- F. specifies why neutrinos are practically weightless.
  - G. explains how neutrinos pass through matter.
  - H. indicates why there are so many neutrinos.
  - J. emphasizes how numerous neutrinos are.
35. A. NO CHANGE  
B. In contrast,  
C. Besides,  
D. In fact,



On some occasions however; neutrinos do collide

36

with other particles. <sup>37</sup> Scientists specifically selected

the site of the IceCube Neutrino Observatory to facilitate the detection of such a collision. Not only is the Antarctic subterranean ice exceptionally clear, it is also less pressurized due to its subzero altitude. These factors increase the chance of DOMs detecting the blue flash that signifies a neutrino collision. Once this detection occurs, data is gathered and transferred to laboratories at the University of Wisconsin. Here, the origin of each of these neutrinos is determined by analyzing the direction and intensity of the flash.

Determining neutrinos' origins could provide scientists with new insights into the universe. For instance, some neutrinos are produced during supernovae (the

collapsing of stars). The origins of these neutrinos could

42

36. F. NO CHANGE

- G. occasions, however.
- H. occasions, however;
- J. occasions, however

37. At this point, the writer is considering adding the following true sentence:

In 1956, during the Cowan-Reines neutrino experiment, a neutrino was detected for the first time.

Should the writer make this addition?

- A. Yes, because the information is relevant to the history of neutrino detection outlined in the paragraph.
- B. Yes, because the information indicates that subzero altitude is essential to the detection of neutrinos.
- C. No, because the information is unrelated to the discussion of why scientists selected the location of the IceCube Neutrino Observatory.
- D. No, because the information is unrelated to why the detection of neutrinos is facilitated by zero-gravity conditions.

38. F. NO CHANGE

- G. Observatory, and to
- H. Observatory. To
- J. Observatory; to

39. A. NO CHANGE

- B. their
- C. its
- D. its'

40. F. NO CHANGE

- G. have been
- H. are being
- J. are

41. Which of the following true sentences best introduces the main idea of the paragraph?

- A. NO CHANGE
- B. For decades, scientists have been trying to learn more about gamma rays through the study of supernovae.
- C. Recently, at IceCube, scientists discovered two neutrinos, which they now refer to as Bert and Ernie.
- D. Neutrinos can now be created in laboratories, using a particle accelerator called a Super Proton Synchrotron.

42. F. NO CHANGE

- G. stars) and the
- H. stars), the
- J. stars) the

1 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ 1

give us opulent information about how, when, and why stars collapse.<sup>43</sup> Scientists are optimistic that the neutrinos detected at IceCube could lead to new ways of looking at our galaxy—and galaxies beyond.<sup>44</sup>

43. A. NO CHANGE  
B. invaluable  
C. upscale  
D. lavish
44. The writer wants to emphasize that information garnered from the detected neutrinos at IceCube could have dramatic effects on how scientists study the universe. Which choice best accomplishes that goal?  
F. NO CHANGE  
G. phenomena that have puzzled scientists over the last decade.  
H. common occurrences in space.  
J. the world around us.

Question 45 asks about the preceding passage as a whole.

45. Suppose the writer's primary purpose had been to outline a scientific theory concerning the origins of a particle in nature. Would this essay accomplish that goal?  
A. Yes, because it explains how scientists are discovering new reasons why neutrinos emit a blue flash known as Cherenkov radiation.  
B. Yes, because it summarizes how DOMs at the IceCube Neutrino Observatory track neutrinos to their origins despite neutrinos' numerous collisions with matter and electromagnetic forces.  
C. No, because it describes instead how neutrinos are detected at an observatory and how these detections could benefit future scientific research.  
D. No, because it details instead how new research on neutrinos could potentially contradict a commonly held theory about supernovae.

PASSAGE IV

Clinton Hill's Found Artist

[1]

At the Urban Vintage, my favorite café here in Clinton Hill, Brooklyn, I found a table by the window and checked the day's news on my laptop. On the *New York Times* home page, I noticed an article about Rafael Leonardo Black, a 64-year-old Clinton Hill artist who had just been discovered. [A]<sup>46</sup>

46. F. NO CHANGE  
G. of whom  
H. which  
J. whom



[2]

Black, a native of Aruba, has been creating art in his New York City studio apartment for over three decades. Until recently, few people had seen his work. I wondered why—and learned he simply never cared to share it. Black has worked as a typist, a salesperson, and a receptionist. He never expected (or tried) to make a living as an artist. However, in May of 2013, art dealer Francis Naumann, directed to Black's art by one of Black's longtime friends, displayed sixteen of the artist's drawings in a solo show.

Within days, ten of Black's pieces sold for, prices ranging from \$16,000 to \$28,000. [B]

[3]

Black draws collages in black No. 2 pencil on white board and they're packed with depictions, in the form of drawings, of ancient myths, historical events, and popular culture. I found a collage titled *Seven Lamps* in a quick search online. [C] It features a representation of a British psychedelic poster, a portrayal of Danish surrealist painter, Wilhelm Freddie, at work, and a tiny figure of Los Angeles architect Simon Rodia. The images are stacked, forming a surreal tower.

47. A. NO CHANGE  
 B. originally from Aruba, for more than half his life  
 C. living in Clinton Hill but a native of Aruba,  
 D. a newly found artist originally from Aruba,
48. Given that all the choices are accurate, which one provides the best transition to the information in the following sentence?  
 F. NO CHANGE  
 G. was taking down an artist's long-running exhibition at his Manhattan gallery.  
 H. became aware that Black had never shown his drawings, formally or otherwise.  
 J. recognized that no one in the New York City art world had heard of Black.
49. A. NO CHANGE  
 B. sold—for  
 C. sold; for  
 D. sold for:
50. F. NO CHANGE  
 G. board. They're  
 H. board, they're  
 J. board they're
51. A. NO CHANGE  
 B. black pencil drawings that depict  
 C. drawings that create collages of  
 D. depictions of
52. F. NO CHANGE  
 G. painter Wilhelm Freddie,  
 H. painter, Wilhelm Freddie  
 J. painter Wilhelm Freddie

1 I wasn't sure how the drawings in *Seven Lamps*—so detailed that I could see the folds in Rodia's clothing—fit

53

together logically, but I liked that there was so much for me to puzzle over. Maybe this complexity

54

in May helps explain why Black's work created such a stir.

55

[4]

I read that Black observes the sudden interest in his drawings. [D] He says he's always been an artist,

56

regardless of who knew it. Given that I know the city, I'll keep checking the *Times* for word of his next show. When

57

I walk home from the Urban Vintage, its décor often being updated with restored antiques and vintage housewares, I

58

wonder if I'll pass the brownstone building where, Black, creates his fascinating, newly found art.

59

53. A. NO CHANGE  
B. has fit  
C. is fit  
D. fits

54. If the writer were to delete the underlined portion (adjusting the punctuation as needed), the essay would primarily lose a:

- F. claim arguing that the reason Naumann chose to show Black's art is that the art offers so much for a viewer to reflect upon and analyze.  
G. detail indicating that the narrator appreciated Black's collage even though he or she might not have understood its overall intent.  
H. comment suggesting that though the narrator enjoys only some of Black's art, he or she is glad that Black has been discovered.  
J. statement revealing the narrator's belief that the best modern art is understood only by the artist who created it.

55. The best placement for the underlined portion would be:

- A. where it is now.  
B. after the word *Maybe*.  
C. after the word *explain*.  
D. after the word *stir* (and before the period).

56. The writer wants to clearly establish that the newspaper article claims Black is unmoved by the sudden interest in his art. Which choice best accomplishes that goal?

- F. NO CHANGE  
G. is nearly a celebrity in Clinton Hill due to  
H. has benefited financially from  
J. gives little thought to

57. Which choice provides the most effective transition from the preceding sentence to this sentence?

- A. NO CHANGE  
B. Since I'm knowledgeable about art and books.  
C. Now that I know about him,  
D. Knowing that I like news,

58. F. NO CHANGE

- G. Vintage, easily carrying my lightweight laptop in my old, navy blue messenger bag,  
H. Vintage this evening—I can't be late to meet a friend exactly at eight—  
J. Vintage tonight,

59. A. NO CHANGE

- B. building where Black  
C. building, where Black  
D. building: where Black

Question 60 asks about the preceding passage as a whole.

60. The writer is considering adding the following sentence to the essay:

Fortunately, the web page included a key that identified the people, places, and events—most of which I had never even heard of—that Black portrays in this piece.

If the writer were to add this sentence, it would most logically be placed at:

- F. Point A in Paragraph 1.
- G. Point B in Paragraph 2.
- H. Point C in Paragraph 3.
- J. Point D in Paragraph 4.

PASSAGE V

**Cher Ami, Pigeon Hero**

Pigeons have a fairly poor reputation. In many urban areas, they are considered little more than,  
<sup>61</sup>  
 “rats with wings,” blamed for spreading disease and  
<sup>62</sup>  
 despoiling statues. For example, one species, the homing  
<sup>63</sup>  
pigeon, which is among the best navigators of the natural  
<sup>64</sup>  
 world. There navigational ability has earned the homely  
<sup>65</sup>  
 pigeon an undeniable place in history.

- 61. A. NO CHANGE  
B. than—  
C. than;  
D. than
- 62. F. NO CHANGE  
G. wings” and they are blamed  
H. wings,” they are blamed  
J. wings.” Blamed
- 63. A. NO CHANGE  
B. Similarly,  
C. However,  
D. Thus,
- 64. F. NO CHANGE  
G. pigeon that  
H. pigeon,  
J. pigeon
- 65. A. NO CHANGE  
B. They’re  
C. It’s  
D. Its

1 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ 1

Former modern technologies like the radio or  
<sup>66</sup> telephone, commanders on the battlefield often faced

challenges in communicating, depending on their location.

One solution was to use homing pigeons to carry messages  
<sup>67</sup> from the front lines back to headquarters. The pigeon was  
a particularly good soldier in such endeavors: It flew fast.

It flew high. And it always quickly returned and came back  
<sup>68</sup> to its home roost.

The most famous avian war hero is perhaps Cher Ami,  
whose name means *dear friend*. One of six hundred birds  
used by the US Army Signal Corps in France during  
World War I, all twelve of Cher Ami's missions were  
<sup>69</sup> deemed successful. His last was instrumental in saving  
<sup>69</sup> hundreds of lives.

Near Verdun, France, the 77th Infantry Division  
became separated from US forces. The men were  
surrounded by German troops and were rapidly running  
out of rations. They were separated from other US forces.  
<sup>70</sup>

They had but one link to headquarters homing pigeons.  
<sup>71</sup>

It was becoming clear that the Americans were unaware  
<sup>72</sup> of the 77th's whereabouts, the situation grew dire.

66. F. NO CHANGE  
G. Before  
H. Earlier  
J. Prior

67. The writer is considering revising the underlined portion to the following:  
especially across long distances and difficult terrain.

Should the writer make this revision?

- A. Yes, because it offers a better indication of the circumstances that made communication difficult.  
B. Yes, because it more clearly identifies the locations of and distances between troops.  
C. No, because it adds information that is irrelevant to the paragraph's discussion of pigeons.  
D. No, because it suggests that homing pigeons are unnecessary today.
68. F. NO CHANGE  
G. speedily returned, coming home  
H. returned home  
J. returned

69. A. NO CHANGE  
B. the twelve missions Cher Ami flew were successful.  
C. successful missions by Cher Ami numbered twelve.  
D. Cher Ami flew twelve successful missions.

70. F. NO CHANGE  
G. German troops were all around them.  
H. They would soon be out of rations.  
J. DELETE the underlined portion.

71. A. NO CHANGE  
B. headquarters:  
C. headquarters;  
D. headquarters,

72. F. NO CHANGE  
G. Having become  
H. As it became  
J. It became

Major Whittlesey wrote a note about the 77th's location, placed it in a canister attached to the pigeon's leg, and watched as the bird flew out in the midst of battle.

Despite being wounded in flight, Cher Ami managed to deliver the message to headquarters; the unit known as "the Lost Battalion" would be rescued.

News reports around the world touted the bird's heroism. The French military awarded Cher Ami a medal, the War Cross. Although one might question

the extent in which Cher Ami understood his mission,

his story proves that pigeons are unique.

73. A. NO CHANGE  
 B. medal, it was the  
 C. medal, that was  
 D. medal. The
74. E. NO CHANGE  
 G. of  
 H. to  
 J. DELETE the underlined portion.
75. Which choice best concludes the sentence and essay by connecting Cher Ami's story to a specific idea raised in the first paragraph of the essay?
- A. NO CHANGE  
 B. is testimony to the homing pigeon's navigational skill and instinct.  
 C. has made people reconsider the definition of heroism.  
 D. suggests that even birds can be brave.

**END OF TEST 1**

**STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.**

## READING TEST

35 Minutes—40 Questions

**DIRECTIONS:** There are several passages in this test. Each passage is accompanied by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

## Passage I

**LITERARY NARRATIVE:** Passage A is adapted from the essay "Touring Home" by Susan Power (©1996 by Susan Power). Passage B is adapted from the memoir *Beyond the Narrow Gate: The Journey of Four Chinese Women from the Middle Kingdom to Middle America* by Leslie Chang (©1999 by Leslie Chang).

## Passage A by Susan Power

My mother tells me stories every day: while she cleans, while she cooks, on our way to the library, standing in the checkout line at the supermarket. I like to share her stories with other people and chatter away  
5 when I am able to command adult attention.

"She left the reservation when she was sixteen years old," I tell my audience. Sixteen sounds very old to me, but I always state the number because it seems integral to my recitation. "She had never been on a train  
10 before or used a telephone. She left Standing Rock to take a job in Chicago so she could help out the family during the War. She was so petrified of the new surroundings, she stayed in her seat all the way from McLaughlin, South Dakota, to Chicago, Illinois, and  
15 didn't move once."

I usually laugh after saying this because I cannot imagine my mother being afraid of anything. She is so tall, a true Dakota woman; she rises against the sun like a skyscraper, and when I draw her picture in my note-  
20 book, she takes up the entire page. She talks politics and attends sit-ins and says what's on her mind.

I am her small shadow and witness. I am the timid daughter who can rage only on paper.

We don't have much money, but Mom takes me  
25 from one end of the city to the other, on foot, on buses. I will grow up believing that Chicago belongs to me, because it was given to me by my mother.

Some days we haunt the Art Institute, and my mother pauses before a Picasso. "He did this during his  
30 blue period," she tells me.

I squint at the blue man holding a blue guitar. "Was he very sad?" I ask.

"Yes, I think he was." My mother takes my hand and looks away from the painting. I can see a story  
35 developing behind her eyes, and I tug on her arm to release the words. She will tell me why Picasso was blue, what his thoughts were as he painted this canvas. She relates anecdotes I will never find in books, never see footnoted in a biography of the master artist. I don't  
40 even bother to check these references because I like my mother's version best.

## Passage B by Leslie Chang

Water belongs to everyone and to no one. For this reason, I have always had a particular affinity for it, which may strike some as mysterious. Westerners ask  
45 me where my parents were born, as though the answer will enable them to glean some knowledge. The answer is Beijing and Luoyang. The truth is that this response signifies nothing. The meaningful question would be to ask where my ancestors lived. The answer to that is  
50 inland. My father's people came from Wuhan, birthplace of the Chinese republic and the capital of Hubei, that sweltering province sandwiched between Sichuan and Anhui. My mother's father was from Inner Mongolia, land of desert and grassy plains.

55 Yet water calls to me. I remain convinced that I would find peace if I could only have a house by the ocean. I insisted on being married near the sea. This bond, I know, comes from my mother.

She longs for a view more than anything else.  
60 Once, staying at a hotel in San Francisco, she insisted on seeing three different rooms before she found one with which she was satisfied. It was on a floor so high it made me dizzy, with a corner window overlooking the bay: Even so, my mother spent most of her time on  
65 the bridge linking the elevator bank to our wing. The bridge consisted almost entirely of windows. It offered a view in either direction that was brilliant and blinding. If there had been a chair, she could have sat forever, letting the gold sun and blue sea overwhelm her  
70 through the glass.

My mother may have descended from inland people, but they were also nomads. Her father once rode his horse practically the length of China, from Inner Mongolia to Guangzhou, a distance of some  
75 twelve hundred miles. My mother could only become a

nomad herself—forever moving, changing and going, yet always retaining some essential part of her being, recognizable and intact in spite of all the places she has been. In this, she is like water, not dead water but fear-  
 80 somely alive. When she gazes out on its shimmering expanse, she sees her own reflection. When I gaze out, I see her, my mother, always pulling away, returning and pulling away again. I drink from her, and she slips between my fingertips. She has borne me all this way. I  
 85 cannot decide whether I want her to stay or go. When she is here, I wish she would leave. When she is gone, I wish she would return. She pulls away again, a force as elemental as the ebbing tide. I remain a child on the shore, eagerly collecting the sea glass and driftwood  
 90 she has left behind.

Questions 1–3 ask about Passage A.

- In Passage A, the narrator directly compares her mother to a:
  - Picasso painting.
  - shadow and witness.
  - story behind someone's eyes.
  - skyscraper against the sun.
- The narrator of Passage A most strongly suggests that the reason she began to believe Chicago belongs to her is that she:
  - could eventually take several different routes to travel from one end of the city to the other without getting lost.
  - had watched her mother directly influence the politics of the city.
  - felt she could move about the city almost unseen, like a small shadow.
  - initially explored the city with her mother as her affirming guide, so her connection to the city seemed familial.
- It can most reasonably be inferred from Passage A that the narrator doesn't bother to verify that her mother's ideas about Picasso and his work are accurate primarily because the narrator:
  - doesn't know which references would be best for her to consult.
  - is confident that what her mother says about the artist is accurate and feels that checking references would be a waste of time.
  - doesn't care whether her mother is accurate given how much the narrator likes what her mother says about the artist.
  - wants to hold to her own ideas about the artist, regardless of what her mother says about him.

Questions 4–7 ask about Passage B.

- In Passage B, the narrator most strongly suggests that she believes her answer to which of the following questions does not provide significant information about her background?
  - How is your mother like your other ancestors?
  - Where did your ancestors live?
  - Where were your parents born?
  - Why does water call to you?
- As they are used in Passage B, the word *blinding* (line 68) and the word *overwhelm* (line 69) both have a connotation that most strongly suggests a feeling of:
  - fright.
  - awe.
  - regret.
  - quietness.
- In line 79, the word *dead* is most nearly used to describe water that is:
  - colorless.
  - obsolete.
  - stagnant.
  - frozen.
- The last sentence of Passage B can best be described as a:
  - metaphor for the narrator's feelings as her mother goes away from her.
  - memory of childhood and of her mother that the narrator holds dear.
  - literal explanation of the way the narrator reacts to her mother's actions.
  - reference to a set of objects that the narrator as a child often found on the shore.

Questions 8–10 ask about both passages.

- Which of the following actions do the narrators of both passages closely connect with their mothers?
  - Traveling and moving
  - Exploring Chicago streets
  - Speaking openly and boldly
  - Staying at hotels in cities
- The narrator of Passage B would be more likely than the narrator of Passage A to describe her relationship with her mother as being marked by:
  - moments of lively conversation and pure joy.
  - years of fierce competition and debate.
  - displays of physical affection and warmth.
  - feelings of distance and tension.

10. In both Passage A and Passage B, the narrator of the passage shares information about her mother's:
- F. personal history.
  - G. physical appearance.
  - H. academic interests.
  - J. relationship to the narrator's father.

### Passage II

**SOCIAL SCIENCE:** This passage is adapted from *The Frozen-Water Trade: A True Story* by Gavin Weightman (©2003 by Gavin Weightman).

When the first comprehensive report on the ice industry of the United States was commissioned in 1879 as part of a national census, it was estimated that about eight million tons were harvested annually, though the business was so extensive and production so poorly documented that this was, at best, a well-informed guess. The figures were put together by one Henry Hall, who signed himself "special agent" and gave an account of the great growth of the industry in the preceding ten years. Of the eight million tons of ice harvested, about five million reached the consumer—the rest melted during shipment and storage. By far the biggest market was in New York, and none of its ice was manufactured artificially: it was all cut in winter and stored in hundreds of timber warehouses that lined the lakes and rivers and had a capacity of up to fifty thousand tons each. Between New York and Albany, 150 miles up the Hudson River, there were 135 ice-houses, but even this was not enough to supply the metropolis, which relied heavily on imports. In fact, in the year of the great ice census, New York and Philadelphia suffered one of their recurrent ice "famines," when unseasonably warm weather destroyed the harvest on the Hudson and local lakes, and the price of ice rose from \$4 to \$5 a ton. That year the ice was fifteen to twenty inches thick in Maine, a top-quality crop, and it could be shipped down to New York at an estimated cost of \$1.50 a ton. This produced a frenzy of harvesting on the Kennebec, Penobscot, and Sheepscot Rivers, and two thousand cargoes of ice packed in hay and sawdust were shipped south to New York, Philadelphia, and other more southern cities, where they were sold for a total of around \$1.5 million.

Though the demand for ice rose annually, the New York suppliers did not explore the use of artificial refrigeration. Instead, they began to buy up sections of the Kennebec River shoreline and to erect great wooden warehouses there, transforming the landscape of the river for many miles. It was the same farther inland, where ice companies bought up shoreline along the lakes and put up storehouses to supply the meat industry of Chicago and the brewers of Milwaukee, as well as millions of domestic consumers.

The first real crisis in the natural-ice trade was caused not by competition from artificial manufacture, but by pollution. As the cities grew, they encroached on

the rivers and lakes from which the ice was cut, and soon there were health scares. This produced a search for cleaner supplies away from towns, and stimulated the search for a means of manufacturing ice with pure water. The realization that the bacteria that cause diseases such as typhoid were not killed off in frozen water added to the urgency of finding safer forms of refrigeration.

The natural-ice trade began to decline from the early decades of the twentieth century, though in more remote areas of North America where electric power was not available but lake ice was abundant in winter, it survived as late as the 1950s. As ice harvesting died out, the evidence of its former vast scale rapidly disappeared. There was no alternative use for the great ice-houses, many of which simply burned down, often set alight by a spark from a steam train—they were surprisingly flammable, as most were made of wood and kept as dry as possible to better preserve the blocks of ice they housed. But the majority were demolished or simply rotted away.

Over a wide area of the northern states, young diving enthusiasts with no knowledge of the former ice trade still emerge from lakes and rivers clutching an impressive variety of odd implements—plows and chisels and scrapers that fell through the ice during the harvesting. One or two museums keep small displays of these tools, and collectors have preserved manufacturers' catalogs that proudly present their versions of the ice plow, the ice saw, the grapple, the Jack grapple, the breaking-off bar, the caulk bar, the packing chisel, the house bar, the fork bar, the float hook, the line marker, and many other specialist implements the use of which has long been forgotten.

The inner-city icehouses have also gone, and the ice wagon and the iceman are rapidly fading memories. All that is left in America of this once-great industry is the water itself, which provided a continuously renewable supply of ice each winter. There are few memorials on the banks of the rivers and lakes that once produced such a vital crop.

11. Which of the following events referred to in the passage occurred last chronologically?
- A. The first comprehensive report on the ice industry of the United States was commissioned.
  - B. Divers emerged from lakes and rivers clutching ice industry implements.
  - C. Two thousand cargoes of ice were sold for around \$1.5 million.
  - D. The price of ice rose from \$4 to \$5 a ton.



12. The passage states that, in terms of the natural-ice industry, the decade from 1869 to 1879 was characterized by:
- F. significant growth.
  - G. damaging publicity.
  - H. high shipping prices.
  - J. mildly declining demand.
13. As it is used in lines 19–20, the phrase *the metropolis* most likely refers to:
- A. Albany.
  - B. New York City.
  - C. Philadelphia.
  - D. the average US city of the 1870s.
14. Based on the passage, the 1879 Maine ice that was fifteen to twenty inches thick can best be described as:
- F. a top-quality crop that was shipped to New York City, Philadelphia, and destinations further south.
  - G. sufficient for local demand but not a solution to the problem of the ice “famine” in the South.
  - H. typical of Maine crops of ice until the ice “famine” struck.
  - J. remarkable but surpassed in size and quality by crops the following year.
15. The main idea of the fourth paragraph (lines 55–67) is that:
- A. the natural-ice industry declined over several decades, leaving few traces of its magnitude.
  - B. the arrival of the steam train signaled the demise of ice harvesting.
  - C. icehouses were extremely flammable and therefore few remain.
  - D. in the 1950s, the natural-ice industry experienced a short-lived revival.
16. The author most clearly indicates that the contents of the manufacturers’ catalogs referred to in the fifth paragraph (lines 68–80) typify the natural-ice industry’s:
- F. rapid response to market changes.
  - G. ability to erect icehouses quickly.
  - H. wide array of tools.
  - J. simple work.
17. On which of the following points does the author contradict himself elsewhere in the passage?
- A. “Of the eight million tons of ice harvested, about five million reached the consumer” (lines 10–11).
  - B. “The New York suppliers did not explore the use of artificial refrigeration” (lines 34–36).
  - C. “There was no alternative use for the great icehouses” (lines 61–62).
  - D. “All that is left in America of this once-great industry is the water itself” (lines 83–84).
18. According to the passage, in the time period referred to in the first paragraph, how much of New York City’s ice was made artificially?
- F. The vast majority
  - G. About half
  - H. About ten percent
  - J. None
19. The passage states that for shipping purposes, natural ice was sometimes packed in:
- A. refrigerated boxcars.
  - B. waterproof tarps.
  - C. sawdust and hay.
  - D. paper and cloth.
20. The passage indicates that the first real crisis in the natural-ice industry can be attributed to:
- F. the Great Depression.
  - G. weather pattern changes.
  - H. the advent of refrigeration.
  - J. polluted water.

## Passage III

**HUMANITIES:** This passage is adapted from the article "Read My Lips" by Chiara Barzini (©2012 by the Harper's Magazine Foundation).

In the passage, *dubbing* primarily refers to providing a film with a new sound track, especially dialogue, in a different language.

Filmmakers have debated the respective merits of subtitles and dubbing since the earliest sound films. In "The Impossible Life of Clark Costa," published in 1940 in the film journal *Cinema*, director Michelangelo Antonioni wrote that Romolo Costa, the person who dubbed all of actor Clark Gable's performances, was a "hybrid individual born out of a chemical combination." This "half Clark, half Costa" was unbearable to Antonioni, who considered dubbing to be a mere "acoustic surrogate" of acting. To him, dubbing compromised the intention of the director, leading to an artificial product that lacked artistic unity. Director Pier Paolo Pasolini, who called both dubbing and subtitles "evils," said that, between the two, dubbing was the less harmful, since it allowed you to see the picture in full. Director Jean Renoir called dubbing a "monstrosity, a challenge to human and divine laws."

Director Federico Fellini didn't agree with any of them. Dubbing was an extension of his shoots, a technique he would use to retouch and rewrite. He mercilessly dubbed over his actors, changing dialogue in postproduction, sometimes having worked without a script. (He reportedly instructed his actors to count aloud in front of the camera so that he could insert new dialogue afterward.) Renato Cortesi, a veteran Fellini dubber, told me that, during the filming of *Amarcord* (1973), he witnessed Fellini ask an old Neapolitan lady to tell him a sad story. Over footage of this woman recounting a tragic tale about her grandson, Fellini added a new sound track about war and hunger recorded by an actor from Emilia-Romagna, combining the vivid expressiveness of the South with his favorite northern accent.

If you visit a dubbing studio, the over-the-top zest of the actors is evident in everything from their melodramatic speech to their movements; standing in front of the microphone, they coil and twitch. I asked Cortesi whether this was a consequence of having to focus one's lifelong talent into the few centimeters between mouth and microphone, a kind of bodily rebellion to the condition of being heard but not seen, and he laughed. "Of course it isn't easy to spend a life in the darkness, but this is hardly the reason why they twitch and turn! Dubbers are used to reciting while trying to re-create the bodily sensations of what they see on the screen before them. If there is running in the film, they will run on their feet. The moving," he explained, "is the result of re-creating large movements in small spaces."

There are still few options for those seeking to watch subtitled, original-language films at a movie house in Italy. The Metropolitan cinema on Via del Corso closed recently after a long battle involving intel-

lectuals, show-business people, and American and British expats in Rome, to be replaced with a clothing store. Italians remain hooked on dubbing—perhaps because of simple affection. Familiar voices yield emotional attachment.

Francesco Vairano, a dubber and dubbing director known for adapting foreign films considered to be "undubbable," such as the French box office hit *Bienvenue chez les Ch'tis* ("Welcome to the Sticks," 2008), which relies on linguistic misunderstandings for much of its comedy, explained that actors become just as attached to their parts as audiences do. Vairano has been one of the few directors to break the habit of matching the same Italian dubber to a foreign actor for all his films, preferring instead to select the dubber according to the requirements of the role, and, he admits, he was hated by all the prima donna dubbers for this. "If you take that actor away from them," he told me, "they will insult you."

In 2007, I met dubber Luca Ward, who provided the voice of the narrator for a romantic comedy I co-wrote, *Scusa ma Ti Chiamo Amore* ("Sorry but I Love You"). What I didn't then know was that everyone Ward met wanted him to recite actor Samuel L. Jackson's Ezekiel 25:17 passage from the film *Pulp Fiction*, and that I should consider it an honor that he would offer a performance to a stranger. When he finally did recite the monologue, it was astonishing, every dramatic pause carefully timed and every word perfectly enunciated. I understood that, if anybody took Samuel L. Jackson away from Ward, it would have meant taking away a part of his soul; he was, as Antonioni would say, half Ward, half Jackson. Leaving the day's recording session, Ward told me he was off to have dinner with actress Meg Ryan, before raising an eyebrow and clarifying, "With Meg Ryan's dubber . . . I am having dinner with Meg Ryan's voice."

21. The last sentence of the passage primarily serves to illustrate the passage author's central claim that:
- a dubber wants others in the film industry to respect the actor he or she usually dubs.
  - the work of Ryan's dubber is as effective as that of Jackson's dubber.
  - a dubber begins to seem almost like a hybrid of him- or herself and the actor he or she dubs.
  - Ward is unlike most dubbers in that he prefers to dub many different actors.
22. It can reasonably be inferred from the passage that regarding whether dubbing is useful or valuable, Vairano would most strongly sympathize with the views of:
- Antonioni.
  - Fellini.
  - Pasolini.
  - Renoir.

23. The main function of the second paragraph (lines 18–33) is for the passage author to present:
- A. her own ideas as an example of a contemporary perspective on the merits of dubbing.
  - B. a perspective on dubbing that bluntly counters those outlined in the first paragraph.
  - C. Fellini's personal, direct response to Renoir's criticism of his work.
  - D. a claim, centered on Fellini's work, that strengthens the argument she makes in the first paragraph.
24. The anecdote about Fellini's footage of a woman recounting a tragic tale (lines 25–33) primarily serves to:
- F. explain why Fellini preferred to feature voices with northern accents in his films.
  - G. provide a famous example of Fellini closely following scripted dialogue.
  - H. illustrate the extent to which dubbing was a part of Fellini's craft.
  - J. show why Fellini preferred his actors to follow a script rather than tell their own stories.
25. As Cortesi is presented in the passage, does he agree with the passage author's assumptions about the reason for dubbers' "over-the-top zest" (line 34)?
- A. Yes, and he thinks that she should visit his dubbing studio to see how he works.
  - B. Yes, and he suggests that the reason is the dubber's condition of being heard but not seen.
  - C. No, and he gruffly makes clear his belief that she does not at all understand a dubber's work.
  - D. No, and he corrects her misinterpretation with an explanation of his own.
26. It can most reasonably be inferred from the passage that the Metropolitan cinema on Via del Corso was known for showing films that had been:
- F. dubbed only.
  - G. subtitled only.
  - H. both dubbed and subtitled.
  - J. neither dubbed nor subtitled.
27. The passage most strongly suggests that at movie houses in Italy today, compared to subtitled, original-language films, dubbed films can be found:
- A. much more easily.
  - B. about as easily.
  - C. slightly less easily.
  - D. much less easily.
28. The passage indicates that a foreign film with which of the following characteristics is particularly difficult to dub?
- F. Linguistic misunderstanding that creates comedy
  - G. Dramatic action that advances plot
  - H. Reverse chronology that provides context
  - J. Extensive monologues that further characterization
29. According to the passage, the work of dubbing director Vairano differs from that of most other Italian directors in that Vairano:
- A. focuses on dubbing French films into Italian.
  - B. does not necessarily match the same Italian dubber to the same foreign actor for all his films.
  - C. works mostly with "prima donna" dubbers.
  - D. does not believe that dialogue should be rewritten during a dubbing session.
30. As it is used in lines 16–17, the phrase *a challenge to* most nearly means:
- F. an assault on.
  - G. a declaration of.
  - H. a question for.
  - J. an offer to.

## Passage IV

**NATURAL SCIENCE:** This passage is adapted from the essay "Making Stuff: From Bacon to Bakelite" by Philip Ball (©2010 by Philip Ball).

During the Industrial Revolution, the high price of steel meant that many large engineering projects were carried out that used instead cast iron, which is brittle and prone to failure. This was why Henry Bessemer's new process for making steel was greeted with jubilation: the details, announced at a meeting of the British Association in 1856, were published in full in *The Times*. Bessemer himself was lauded not just as an engineer but as a scientist, being elected a Fellow of the Royal Society in 1879.

Bessemer's process controlled the amount of carbon mixed with iron to make steel. That the proportion of carbon governs the hardness was first noted in 1774 by the Swedish metallurgist Torbern Bergmann, who was by any standards a scientist, teaching chemistry, physics and mathematics at Uppsala. Bergmann made an extensive study of the propensity of different chemical elements to combine with one another—a property known as elective affinity, central to the eighteenth-century notion of chemical reactivity. He was a mentor and sponsor of Carl Wilhelm Scheele, the greatest Swedish chemist of the age and co-discoverer of oxygen.

Oxygen, as a component of air, was the key to the Bessemer process. It offered a way of removing impurities from pig iron and adjusting its carbon content during conversion to steel. A blast of air through the molten metal turned impurities such as silicon into light silica slag (a collection of compounds removed from metal in the smelting process), and removed carbon in the form of volatile carbon dioxide. Pig iron contains as much as 4 per cent carbon; steels have only around 0.3–2 per cent. Meanwhile, the heat produced in these reactions with oxygen kept the iron molten without the need for extra fuel.

It was long known that steel can be improved with a spice of other elements. A dash of the metal manganese helps to remove oxygen and sulphur from the iron, and most of the manganese currently produced globally is used for this purpose. Manganese also makes steel stronger, while nickel and chromium improve its hardness. And chromium is the key additive in stainless steel—in a proportion of more than about 11 per cent, it makes the metal rust-resistant. Most modern steels are therefore alloys blended to give the desired properties.

But is this science? Some of the early innovations in steel alloys were chance discoveries, often due to impurities incorporated by accident. In this respect, metallurgy has long retained the air of an artisan craft, akin to the trial-and-error explorations of dyers, glass-makers and potters. But the reason for this empiricism is not that the science of metallurgy is trivial; it is because it is so difficult. According to Rodney

Cotterill, a remarkable British physicist whose expertise stretched from the sciences of materials to that of the brain, 'metallurgy is one of our most ancient arts, but is often referred to as one of the youngest sciences'.

One of the principal difficulties in understanding the behaviour of materials such as steel is that this depends on its structure over a wide range of length scales, from the packing of individual atoms to the size and shape of grains micrometres or even millimetres in size. Science has trouble dealing with such a span of scales. One might regard this difficulty as akin to that in the social sciences, where social behaviour is governed by how individuals behave but also how we interact on the scale of families and neighbourhoods, within entire cities, and at a national level. (That's why the social sciences are arguably among the hardest of sciences too.)

The mechanical properties of metals depend on how flaws in the crystal structure, called defects, move and interact. These defects are produced by almost inevitable imperfections in the regular stacking of atoms in the crystalline material. The most common type of stacking fault is called a dislocation. Metals bend, rather than shattering like porcelain, because dislocations can shift around and accommodate the deformation. But if dislocations accumulate and get entangled, restricting their ability to move, the metal becomes brittle. This is what happens after repeated deformation, causing the cracking known as metal fatigue. Dislocations can also get trapped at the boundaries between the fine, microscopic grains that divide a metal into mosaics of crystallites. The arrest of dislocations at grain edges means that metals may be made harder by reducing the size of their grains, a useful trick for modifying their mechanical behaviour.

31. The main purpose of the passage is to:
- explain in detail the various experiments Bessemer conducted in order to develop a better steel.
  - provide an overview of some of the scientific principles that apply to the creation and behavior of steel.
  - describe some of the philosophical questions concerning metallurgy.
  - illustrate the differences between pig iron and cast iron.
32. The author most likely includes details about the initial response to Bessemer's new steel-making process in order to:
- emphasize that Bessemer's new process was a significant achievement for industry.
  - provide support for the author's opinion that Bessemer's new process was prone to failure.
  - describe Bessemer's qualifications as an engineer.
  - provide specific examples of the criticism that Bessemer's new process received.

33. It can reasonably be inferred that the author includes the information that Bergmann was a mentor and sponsor of Scheele's mainly to:
- A. introduce the fact that Bergmann was a teacher as well as a scientist.
  - B. suggest that Bergmann was a more successful scientist than Scheele was.
  - C. give an example of the eighteenth-century notion of scientific communities.
  - D. reinforce Bergmann's credibility as a scientist.
34. According to the passage, which of the following conversions is a direct result of adding oxygen to molten pig iron?
- F. Light silica slag is converted into carbon dioxide.
  - G. Carbon dioxide is converted into carbon.
  - H. Silicon is converted into light silica slag.
  - J. Impurities in the metal are converted into silicon.
35. In the context of the passage, the main effect of the word "spice" (line 37) is to emphasize that:
- A. elements must be gradually mixed into steel in order to produce the desired effect.
  - B. adding certain elements to steel can enrich the steel's quality.
  - C. manganese, chromium, and nickel are used sparingly in steel because of their expense.
  - D. blending elements is a trial-and-error process that has not yet yielded positive results.
36. Based on the passage, with which of the following statements would the author most likely agree?
- F. Metallurgy is not an art because it requires too much scientific knowledge.
  - G. Metallurgy is too difficult to be considered a science.
  - H. Metallurgy is a science as well as an art.
  - J. Metallurgy is a trivial science.
37. The passage most strongly suggests that the study of the behavior of materials and the study of the social sciences are similar because they:
- A. require analyses that span a wide range of scales.
  - B. are based on trial-and-error experimentation.
  - C. involve examination of the size and shape of individual atoms.
  - D. produce results that must be interpreted by both scientists and artists.
38. The main idea of the last paragraph is that:
- F. defects in the crystal structure of a metal determine that metal's mechanical properties.
  - G. dislocations are the most common type of stacking fault in a metal.
  - H. the mechanical behavior of a metal can be modified by increasing the size of a metal's grains.
  - J. microscopic grains divide a metal into mosaics of crystallites.
39. As it is used in line 56, the word *stretched* most nearly means:
- A. strained.
  - B. exaggerated.
  - C. extended.
  - D. amplified.
40. According to the passage, reducing the size of a metal's grains can make the metal:
- F. more rust-resistant.
  - G. more brittle.
  - H. finer.
  - J. harder.

END OF TEST 3

STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

DO NOT RETURN TO A PREVIOUS TEST.

### Scoring Keys for Form C01

Use the scoring key for each test to score your answer document for the multiple-choice tests. Mark a "1" in the blank for each question you answered correctly. Add up the numbers in each reporting category and enter the total number correct for each reporting category in the blanks provided. Also enter the total number correct for each test in the blanks provided. The total number correct for each test is the sum of the number correct in each reporting category.

#### Test 1: English—Scoring Key

Key	Reporting Category*		
	POW	KLA	CSE
1. C			—
2. H			—
3. B		—	
4. H			—
5. C			—
6. F	—		
7. A	—		
8. G			—
9. A	—		
10. H			—
11. D			—
12. G			—
13. B			—
14. J		—	
15. A	—		
16. J			—
17. C			—
18. F	—		
19. A		—	
20. F	—		
21. B			—
22. J			—
23. B			—
24. H			—
25. A	—		
26. J			—
27. A		—	
28. H			—
29. D		—	
30. G	—		
31. D		—	
32. G			—
33. B			—
34. J	—		
35. D	—		
36. G			—
37. C	—		
38. F			—

Key	Reporting Category*		
	POW	KLA	CSE
39. C			—
40. F			—
41. A	—		
42. F			—
43. B		—	
44. F	—		
45. C	—		
46. F			—
47. A		—	
48. F	—		
49. B			—
50. G			—
51. D		—	
52. J			—
53. A			—
54. G	—		
55. D			—
56. J	—		
57. C	—		
58. J	—		
59. B			—
60. H	—		
61. D			—
62. F			—
63. C	—		
64. H			—
65. D			—
66. G		—	
67. A	—		
68. J		—	
69. D			—
70. J		—	
71. B			—
72. H			—
73. A			—
74. H			—
75. B	—		

#### \*Reporting Categories

POW = Production of Writing

KLA = Knowledge of Language

CSE = Conventions of Standard English

Number Correct (Raw Score) for:	
Production of Writing (POW)	_____ (23)
Knowledge of Language (KLA)	_____ (12)
Conventions of Standard English (CSE)	_____ (40)
Total Number Correct for English Test (POW + KLA + CSE)	_____ (75)

Test 2: Mathematics—Scoring Key

Key	Reporting Category*						
	PHM					IES	MDL
	N	A	F	G	S		
1. E							
2. H							
3. B							
4. J							
5. A							
6. F							
7. B							
8. H							
9. C							
10. J							
11. C							
12. H							
13. E							
14. H							
15. D							
16. F							
17. C							
18. G							
19. A							
20. J							
21. B							
22. H							
23. A							
24. F							
25. C							
26. F							
27. E							
28. H							
29. E							
30. F							

Key	Reporting Category*						
	PHM					IES	MDL
	N	A	F	G	S		
31. B							
32. K							
33. C							
34. J							
35. D							
36. K							
37. E							
38. K							
39. B							
40. H							
41. B							
42. F							
43. D							
44. G							
45. D							
46. H							
47. A							
48. G							
49. D							
50. J							
51. E							
52. J							
53. E							
54. G							
55. D							
56. J							
57. A							
58. G							
59. E							
60. K							

Combine the totals of these columns and put in the blank for PHM in the box below.

**\*Reporting Categories**

- PHM = Preparing for Higher Math
- N = Number & Quantity
- A = Algebra
- F = Functions
- G = Geometry
- S = Statistics & Probability
- IES = Integrating Essential Skills
- MDL = Modeling

Number Correct (Raw Score) for:	
Preparing for Higher Math (PHM) (N + A + F + G + S)	(35)
Integrating Essential Skills (IES)	(25)
Total Number Correct for Mathematics Test (PHM + IES)	(60)
Modeling (MDL) (Not included in total number correct for mathematics test raw score)	(24)

**Test 3: Reading—Scoring Key**

Key	Reporting Category*		
	KID	CS	IKI
1. D	—		
2. J	—		
3. C	—		
4. H	—		
5. B		—	
6. H		—	
7. A		—	
8. F			—
9. D			—
10. F			—
11. B	—		
12. F	—		
13. B	—		
14. F	—		
15. A	—		
16. H	—		
17. D			—
18. J	—		
19. C	—		
20. J	—		

Key	Reporting Category*		
	KID	CS	IKI
21. C			—
22. G		—	
23. B		—	
24. H		—	
25. D	—		
26. G	—		
27. A	—		
28. F	—		
29. B	—		
30. F		—	
31. B		—	
32. F			—
33. D		—	
34. H	—		
35. B		—	
36. H	—		
37. A	—		
38. F	—		
39. C		—	
40. J	—		

**\*Reporting Categories**

KID = Key Ideas & Details

CS = Craft & Structure

IKI = Integration of Knowledge & Ideas

Number Correct (Raw Score) for:	
Key Ideas & Details (KID)	(23)
Craft & Structure (CS)	(11)
Integration of Knowledge & Ideas (IKI)	(6)
<b>Total Number Correct for Reading Test</b> (KID + CS + IKI)	<b>(40)</b>

**Test 4: Science—Scoring Key**

Key	Reporting Category*		
	IOD	SIN	EMI
1. A	—		
2. J	—		
3. D	—		
4. G	—		
5. D			—
6. G	—		
7. B		—	
8. G		—	
9. A	—		
10. H		—	
11. D			—
12. H			—
13. B	—		
14. G	—		
15. B	—		
16. H		—	
17. A			—
18. F		—	
19. C		—	
20. F			—

Key	Reporting Category*		
	IOD	SIN	EMI
21. C		—	
22. F			—
23. D		—	
24. H	—		
25. B		—	
26. J		—	
27. B			—
28. H	—		
29. C	—		
30. J	—		
31. B	—		
32. F	—		
33. A	—		
34. F			—
35. C			—
36. F			—
37. B			—
38. J			—
39. B			—
40. F			—

**\*Reporting Categories**

IOD = Interpretation of Data

SIN = Scientific Investigation

EMI = Evaluation of Models, Inferences & Experimental Results

Number Correct (Raw Score) for:	
Interpretation of Data (IOD)	(16)
Scientific Investigation (SIN)	(10)
Evaluation of Models, Inferences & Experimental Results (EMI)	(14)
<b>Total Number Correct for Science Test</b> (IOD + SIN + EMI)	<b>(40)</b>



## Explanation of Procedures Used to Obtain Scale Scores from Raw Scores

On each of the four tests on which you marked any responses, the total number of correct responses yields a raw score. Use the table below to convert your raw scores to scale scores. For each test, locate and circle your raw score or the range of raw scores that includes it in the table below. Then, read across to either outside column of the table and circle the scale score that corresponds to that raw score. As you determine your scale scores, enter them in the blanks provided on the right. The highest possible scale score for each test is 36. The lowest possible scale score for any test on which you marked any responses is 1.

Next, compute the Composite score by averaging the four scale scores. To do this, add your four scale scores and divide the sum by 4. If the resulting number ends in a fraction, round it off to the nearest whole number. (Round down any fraction less than one-half; round up any fraction that is one-half or more.) Enter this number in the blank. This is your Composite score. The highest possible Composite score is 36. The lowest possible Composite score is 1.

ACT Test C01	Your Scale Score
English	_____
Mathematics	_____
Reading	_____
Science	_____
<b>Sum of scores</b>	_____
<b>Composite score (sum ÷ 4)</b>	_____

NOTE: If you left a test completely blank and marked no items, do not list a scale score for that test. If any test was completely blank, do not calculate a Composite score.

Scale Score	Raw Scores				Scale Score
	Test 1 English	Test 2 Mathematics	Test 3 Reading	Test 4 Science	
36	73-75	58-60	39-40	39-40	36
35	70-72	56-57	38	38	35
34	69	54-55	37	—	34
33	68	52-53	36	37	33
32	67	51	35	36	32
31	66	50	—	—	31
30	65	48-49	34	35	30
29	64	46-47	33	34	29
28	62-63	44-45	32	33	28
27	61	41-43	31	32	27
26	59-60	38-40	30	31	26
25	57-58	36-37	29	29-30	25
24	54-56	34-35	28	27-28	24
23	51-53	32-33	26-27	25-26	23
22	49-50	30-31	25	23-24	22
21	46-48	29	24	21-22	21
20	43-45	28	22-23	19-20	20
19	41-42	26-27	21	18	19
18	40	24-25	20	16-17	18
17	38-39	21-23	18-19	14-15	17
16	35-37	18-20	17	13	16
15	31-34	14-17	15-16	12	15
14	29-30	11-13	14	10-11	14
13	27-28	9-10	12-13	9	13
12	24-26	7-8	11	8	12
11	21-23	6	9-10	7	11
10	18-20	5	8	6	10
9	16-17	4	7	5	9
8	13-15	3	6	4	8
7	11-12	—	5	—	7
6	9-10	2	4	3	6
5	7-8	—	3	2	5
4	5-6	1	—	—	4
3	4	—	2	1	3
2	2-3	—	1	—	2
1	0-1	0	0	0	1