

CHOOSING THE RIGHT TEST – ACT DIAGNOSTIC

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DIRECTIONS

This diagnostic test contains questions from a practice ACT released by the creators of the test. It is designed for you to gauge your familiarity with the material on the test and your comfort with the format of the test.

- Though this test is untimed, it should take around 45 minutes to complete. As you go, note the amount of time you spent on each section
- For the Math section, answer only the ODD questions
- For the Essay section, consider how you would answer the essay prompt. You do not have to write a whole essay

TEST STRUCTURE

The ACT has four sections (English, Math, Reading, and Science) plus an optional essay. The full test takes around three and a half hours to complete.

All the questions on the test are multiple choice. There is no penalty for guessing.

ENGLISH

- The English section lasts 45 minutes and has 75 questions on 5 passages
- The questions cover the standard rules of grammar and style

MATH

- The Math section lasts 60 minutes and has 60 individual questions.
- You may use an approved calculator (most graphing calculators are acceptable, included the TI-83 and TI-84)
- The questions cover algebra, geometry, a small amounts of advanced math (such as logarithms, matrices, and trigonometry)

READING

- The Reading section lasts 35 minutes and has 40 questions on 4 passages
- The passages cover Prose Fiction, Social Sciences, Humanities, and Natural Sciences.
- The questions ask what is directly stated or can be inferred from the passage

SCIENCE

- The Science section lasts 35 minutes and has 40 questions on 6 passages
- The passages cover Physics, Biology, Chemistry, and Earth/Space science
- The questions ask about Science Logic, not Science Facts

ESSAY

- The Essay section lasts 40 minutes
- You will be given one prompt and asked to write an essay in response

SCORING



Each of the four sections is scored from 1 to 36. These scores are then averaged to find your “Composite Score,” which is the number colleges use for admissions decisions.

The English, Mathematics, and Reading Sections have “sub-scores” from 1 to 18, which do not generally affect admission decisions. That said, they can help you focus your studies.

Don’t worry about scores for now. Focus on what you like and dislike about the test.



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

The Triangular Snowflake

[1]

Snowflakes form from tiny water droplets, following a specific process of chemical bonding as they freeze, which results in a six-sided figure. The rare “triangular” snowflake, similarly, confounded scientists for years because it apparently defied the basic laws of chemistry. [A] The seemingly triangular shape of those snowflakes suggests that forming through a different process of chemical bonding. [B] By re-creating snowflake formation, a discovery has revealed to scientists Kenneth Libbrecht and Hannah Arnold the cause of this apparent variation.

[2]

Snowflakes begin to form when water in the atmosphere freezes it causes the water molecules to bond into a hexagonal shape. During the flake’s descent from Earth’s upper atmosphere, other water vapor molecules bumps into the hexagonal structure.

- A. NO CHANGE
 B. form, from tiny, water droplets,
 C. form from tiny, water, droplets
 D. form, from tiny water droplets
- F. NO CHANGE
 G. for example,
 H. additionally,
 J. however,
- A. NO CHANGE
 B. the manner in which formation
 C. which had formed
 D. that they form
- F. NO CHANGE
 G. the discovery of the cause of this apparent variation has been made by scientists Kenneth Libbrecht and Hannah Arnold.
 H. scientists Kenneth Libbrecht and Hannah Arnold have discovered the cause of this apparent variation.
 J. the cause of this apparent variation has been discovered by scientists Kenneth Libbrecht and Hannah Arnold.
- A. NO CHANGE
 B. freezes, causing
 C. freezes, it causes
 D. freezes, this causes
- F. NO CHANGE
 G. has bumped
 H. bumped
 J. bump



Bypassing the liquid water phase, those molecules
condense directly onto the established hexagonal pattern.

As a result, the flake grows outward into bigger and more complex hexagonal arrangements surrounding the original hexagonal shape at the center of the flake. [C]

[3]

In 2009, Libbrecht and Arnold's experiments revealed that triangular snowflakes begin with the same process of chemical bonding and forms a hexagonal shape. The triangular shape is an illusion resulting from

one significant addition to the process dust.

[4]

Triangular snowflakes begin to form when a tiny dust particle or other such impurity collides with the flake as it falls, thereby pushing one edge upward. [D] The downward edge of the snowflake encounters more wind resistance than the rest of the flake. The greater the pressure from the wind, causes bonds to form

quick at this edge than in the rest of the snowflake.

[5]

The resulting snowflake has three long sides and three sides that are so short they are difficult to detect. Although these snowflakes appear to have a triangular shape—they actually have a hexagonal pattern. Such snowflakes offer evidence that even when impurities

interfere, the basic laws of chemistry still apply.

7. If the writer were to delete the underlined portion (adjusting the capitalization as needed), the sentence would primarily lose:

- A. an explanation of the process water molecules undergo to change from liquid to vapor to solid.
- B. a detail that mentions a step some water molecules skip in changing from vapor to solid.
- C. a visual description of what water vapor molecules look like.
- D. an explanation of how molecules react to various air temperatures.

8. F. NO CHANGE
G. were they to form
H. if they formed
J. form

9. A. NO CHANGE
B. process is
C. process:
D. process;

10. F. NO CHANGE
G. pressure from the wind, which
H. the pressure, as the wind
J. pressure from the wind

11. A. NO CHANGE
B. more quickly
C. most quickly
D. quickest

12. F. NO CHANGE
G. shape,
H. shape;
J. shape:

13. Which choice most effectively concludes the sentence and the essay?

- A. NO CHANGE
- B. scientists can be certain that a solution to even the most confusing event will be found.
- C. snowflakes will still fall if atmospheric conditions are favorable.
- D. snowflakes come in many different shapes and sizes.



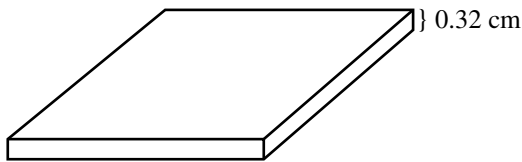
7. The first term is 1 in the geometric sequence $1, -3, 9, -27, \dots$. What is the SEVENTH term of the geometric sequence?
- A. -243
 B. -30
 C. 81
 D. 189
 E. 729

8. The shipping rate for customers of Ship Quick consists of a fee per box and a price per pound for each box. The table below gives the fee and the price per pound for customers shipping boxes of various weights.

Weight of box (pounds)	Fee	Price per pound
Less than 10	\$ 5.00	\$1.00
10–25	\$10.00	\$0.65
More than 25	\$20.00	\$0.30

Gregg wants Ship Quick to ship 1 box that weighs 15 pounds. What is the shipping rate for this box?

- F. \$ 9.75
 G. \$16.50
 H. \$19.75
 J. \$20.00
 K. \$24.50
9. A computer chip 0.32 cm thick is made up of layers of silicon. If the top and bottom layers are each 0.03 cm thick and the inner layers are each 0.02 cm thick, how many inner layers are there?
10. The table below shows the number of cars Jing sold each month last year. What is the median of the data in the table?



Month	Number of cars sold
January	25
February	15
March	22
April	19
May	16
June	13
July	19
August	25
September	26
October	27
November	28
December	29

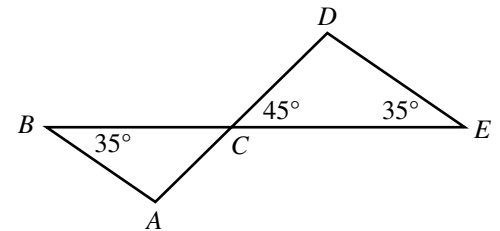
- F. 13
 G. 16
 H. 19
 J. 20.5
 K. 23.5

11. Students studying motion observed a cart rolling at a constant rate along a straight line. The table below gives the distance, d feet, the cart was from a reference point at 1-second intervals from $t = 0$ seconds to $t = 5$ seconds.

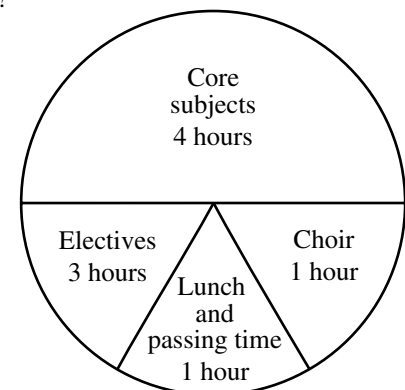
t	0	1	2	3	4	5
d	14	20	26	32	38	44

Which of the following equations represents this relationship between d and t ?

- A. $d = t + 14$
 B. $d = 6t + 8$
 C. $d = 6t + 14$
 D. $d = 14t + 6$
 E. $d = 34t$
12. The length of a rectangle with area 54 square centimeters is 9 centimeters. What is the perimeter of the rectangle, in centimeters?
- F. 6
 G. 12
 H. 15
 J. 24
 K. 30
13. In the figure below, C is the intersection of \overline{AD} and \overline{BE} . If it can be determined, what is the measure of $\angle BAC$?



- A. 80°
 B. 100°
 C. 110°
 D. 115°
 E. Cannot be determined from the given information
14. Antwan drew the circle graph below describing his time spent at school in 1 day. His teacher said that the numbers of hours listed were correct, but that the central angle measures for the sectors were not correct. What should be the central angle measure for the Core subjects sector?

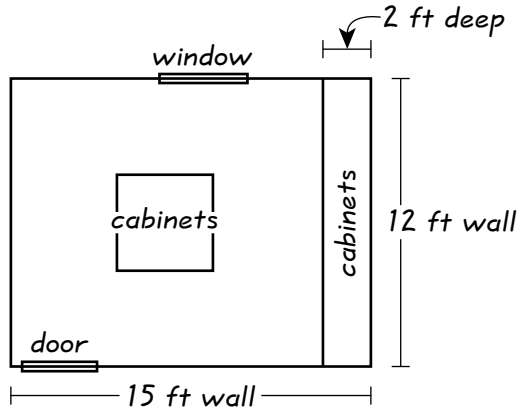


- F. 72°
 G. 80°
 H. 160°
 J. 200°
 K. 288°



Use the following information to answer questions 33–35.

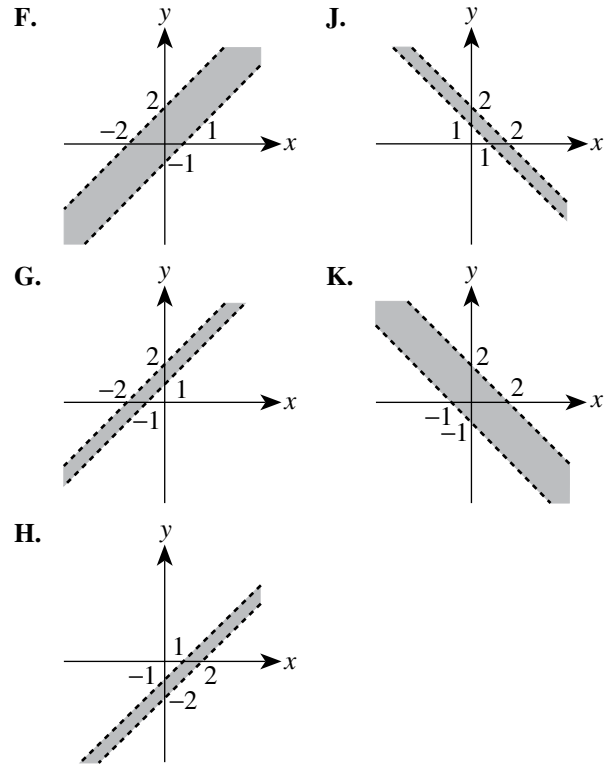
Gianna is converting a 12-foot-by-15-foot room in her house to a craft room. Gianna will install tile herself but will have CC Installations build and install the cabinets. The scale drawing shown below displays the location of the cabinets in the craft room (0.25 inch represents 2 feet).



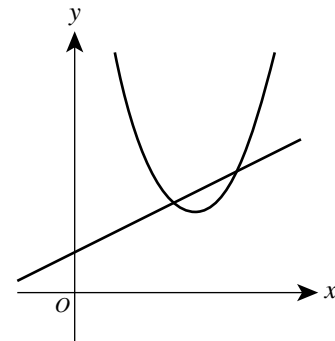
Cabinets will be installed along one of the 12-foot walls from floor to ceiling, and 4 cabinets that are each 3 feet tall will be installed in the middle of the room. These are the only cabinets that will be installed, and each of them will be 2 feet wide and 2 feet deep. CC Installations has given Gianna an estimate of \$2,150.00 for building and installing the cabinets.

33. A 15-foot wall is how many inches long in the scale drawing?
- A. 1.5
B. 1.875
C. 3
D. 3.375
E. 3.75
34. Gianna will install tile on the portion of the floor that will NOT be covered by cabinets. What is the area, in square feet, of the portion of the floor that will NOT be covered by cabinets?
- F. 72
G. 90
H. 140
J. 156
K. 164
35. CC Installations' estimate consists of a \$650.00 charge for labor, plus a fixed charge per cabinet. The labor charge and the charge per cabinet remain the same for any number of cabinets built and installed. CC Installations would give Gianna what estimate if the craft room were to have twice as many cabinets as Gianna is planning to have?
- A. \$2,800.00
B. \$3,000.00
C. \$3,450.00
D. \$3,650.00
E. \$4,300.00

36. Which of the following is the graph of the region $1 < x + y < 2$ in the standard (x,y) coordinate plane?



37. What is the difference between the mean and the median of the set $\{3, 8, 10, 15\}$?
- A. 0
B. 1
C. 4
D. 9
E. 12
38. Which of the following describes a true relationship between the functions $f(x) = (x - 3)^2 + 2$ and $g(x) = \frac{1}{2}x + 1$ graphed below in the standard (x,y) coordinate plane?



- F. $f(x) = g(x)$ for exactly 2 values of x
G. $f(x) = g(x)$ for exactly 1 value of x
H. $f(x) < g(x)$ for all x
J. $f(x) > g(x)$ for all x
K. $f(x)$ is the inverse of $g(x)$

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55. Kelly asked 120 students questions about skiing. The results of the poll are shown in the table below.

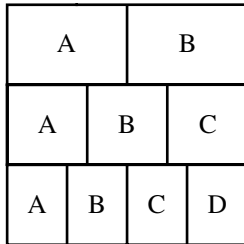
Question	Yes	No
1. Have you skied either cross-country or downhill?	65	55
2. If you answered Yes to Question 1, did you ski downhill?	28	37
3. If you answered Yes to Question 1, did you ski cross-country?	45	20

After completing the poll, Kelly wondered how many of the students polled had skied both cross-country *and* downhill. How many of the students polled indicated that they had skied both cross-country and downhill?

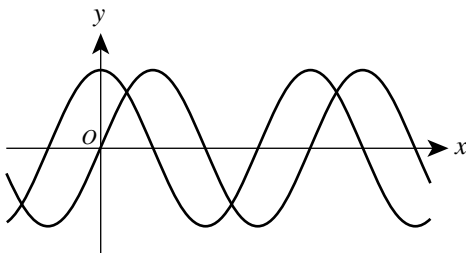
- A. 73
- B. 65
- C. 47
- D. 18
- E. 8

56. The square below is divided into 3 rows of equal area. In the top row, the region labeled A has the same area as the region labeled B. In the middle row, the 3 regions have equal areas. In the bottom row, the 4 regions have equal areas. What fraction of the square's area is in a region labeled A?

- F. $\frac{1}{9}$
- G. $\frac{3}{9}$
- H. $\frac{6}{9}$
- J. $\frac{13}{12}$
- K. $\frac{13}{36}$



57. The functions $y = \sin x$ and $y = \sin(x + a) + b$, for constants a and b , are graphed in the standard (x,y) coordinate plane below. The functions have the same maximum value. One of the following statements about the values of a and b is true. Which statement is it?



- A. $a < 0$ and $b = 0$
- B. $a < 0$ and $b > 0$
- C. $a = 0$ and $b > 0$
- D. $a > 0$ and $b < 0$
- E. $a > 0$ and $b > 0$

58. Which of the following number line graphs shows the solution set to the inequality $|x - 5| < -1$?

- F.
- G.
- H.
- J.
- K.

59. As part of a probability experiment, Elliott is to answer 4 multiple-choice questions. For each question, there are 3 possible answers, only 1 of which is correct. If Elliott randomly and independently answers each question, what is the probability that he will answer the 4 questions correctly?

- A. $\frac{27}{81}$
- B. $\frac{12}{81}$
- C. $\frac{4}{81}$
- D. $\frac{3}{81}$
- E. $\frac{1}{81}$

60. The sides of an acute triangle measure 14 cm, 18 cm, and 20 cm, respectively. Which of the following equations, when solved for θ , gives the measure of the smallest angle of the triangle?

(Note: For any triangle with sides of length a , b , and c that are opposite angles A , B , and C , respectively, $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ and $c^2 = a^2 + b^2 - 2ab \cos C$.)

- F. $\frac{\sin \theta}{14} = \frac{1}{18}$
- G. $\frac{\sin \theta}{14} = \frac{1}{20}$
- H. $\frac{\sin \theta}{20} = \frac{1}{14}$
- J. $14^2 = 18^2 + 20^2 - 2(18)(20)\cos \theta$
- K. $20^2 = 14^2 + 18^2 - 2(14)(18)\cos \theta$

END OF TEST 2

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

DO NOT RETURN TO THE PREVIOUS TEST.

Passage II

SOCIAL SCIENCE: This passage is adapted from *Great Waters: An Atlantic Passage* by Deborah Cramer (©2001 by Deborah Cramer).

The Sargasso Sea is a part of the northern Atlantic Ocean.

As the *Cramer* idles through the Sargasso Sea, waiting for the wind to rise, the sea is flat and empty. Nothing demarcates or divides the smooth expanse of water dissolving into the horizon. This vast, unrough-
5 ened surface, this breadth of uniform sea, deceives. But for a few lonely oceanic islands, the unperturbed surface offers no hint of the grand and sweeping energies hidden below.

Only one thousand miles offshore, the *Cramer* has
10 already sailed through some of Atlantic's deepest waters. Contrary to what one might guess, Atlantic's deepest waters, like those in other oceans, are along her edges. As we continue east, toward the middle of the sea, the bottom rises. The unmarked plains of the abyss,
15 here flattened by layers of sediment, give way to rising foothills and then to mountains. The first maps of Atlantic seafloor noted, albeit crudely, this rise. Early efforts to plumb Atlantic's depths proved outrageously inaccurate: one naval officer paid out eight miles (thir-
20 teen kilometers) of hemp rope from a drifting ship and concluded the sea had no bottom. Eventually, sailors more or less successfully calculated depth by heaving overboard cannonballs tied to bailing twine. When they hit bottom, the sailors measured and snipped the twine
25 and then moved on, leaving a trail of lead strung out across the seafloor. These crude soundings, forming the basis of the first map of Atlantic's basin, published in 1854, identified a prominent rise halfway between Europe and America.

For many years no one could explain why the
30 basin of Atlantic, unlike a bowl, deepened at its edges and shoaled in its center. People assumed that this "Middle Ground," "Telegraph Plateau," or "Dolphin Rise," as it was variously called, was an ancient and
35 drowned land bridge, or a lost continent, but sailors repairing transatlantic telegraph cable unknowingly produced evidence to prove otherwise. Wrestling with the broken cable, they accidentally twisted off a piece of the "plateau" and dredged up a twenty-one-pound
40 (ten-kilogram) chunk of dense black volcanic rock. It was some of the youngest, freshest rock on earth, and it was torn not from a piece of continent sunk beneath the waves, but from the very foundation of the sea.

Today, highly sophisticated sound waves bring the
45 hazy images of those early soundings into sharp focus, revealing that one of the largest and most salient geographic features on the planet lies on the floor of the ocean. Hidden beneath the waves is an immense sub-merged mountain range, the backbone of the sea. More
50 extensive, rugged, and imposing than the Andes, Rockies, or Himalayas, it covers almost as much of earth's surface as the dry land of continents. Winding like the seam of a baseball, it circles the planet in a long, sinu-

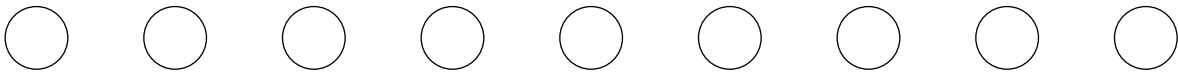
ous path, running the entire length of Atlantic, slashing
55 the basin neatly in two. Its mountains are stark and black, as black as the sea itself, lit only at their peaks by a thin, patchy covering of white, the skeletal remains of tiny microscopic animals that once lived at the surface. Peaks as high as Mount St. Helens sit in a watery
60 world of blackness, more than a mile below the surface, beyond the reach of light, beyond the sight of sailors.

A great valley, eclipsing any comparable feature on dry land, runs through these mountains. Arizona's Grand Canyon, one of earth's most spectacular places,
65 extends for about 280 miles (450 kilometers). A lesser-known canyon of similar depth but considerably greater length lies hidden in the mountains of the ridge. Although offset in many places by breaks in the moun-
70 tains, the rift valley, as the canyon is called, extends the length of Atlantic for 11,000 miles (17,700 kilometers). Here in this bleak and forbidding place, where the water is almost freezing, subterranean fires have lifted mounds of fresh lava onto the seafloor. Scientists visit-
75 ing the rift valley for the first time named the volcanic hills in this otherworldly setting after distant, lifeless planets.

Yet, what had seemed so foreign to scientists is an integral part of earth's very being, for at the ridge our own planet gives birth. The floor of the rift valley is
80 torn; from the gashes has sprung the seafloor underlying all of Atlantic. Here the youngest, newest pieces are made. Earth is still cooling from her tumultuous birth four and a half billion years ago. Heat, leaking from the molten core and from radioactive decay deep inside the
85 planet, rises toward earth's surface, powering the volcanoes that deliver the ridge to the sea.

11. The author's attitude toward the main subject of the passage can best be described as:
- A. awe and fascination.
 - B. disbelief and cynicism.
 - C. amusement and nostalgia.
 - D. boredom and indifference.
12. The passage makes clear that "Middle Ground," "Telegraph Plateau," and "Dolphin Rise" were names that people gave to what was actually:
- F. an island in Atlantic.
 - G. a transatlantic telegraph cable.
 - H. an ancient and drowned land bridge.
 - J. the immense mountain range in Atlantic's basin.

13. In the first paragraph, the author describes the stillness of the Sargasso Sea as the *Cramer* passes through it primarily to emphasize that the stillness:
- A. won't last long, for the sea will become rough when the wind rises.
 - B. makes it easy for a passenger on the *Cramer* to spot oceanic islands that break the water's surface.
 - C. is in dramatic contrast to the power of what exists on and under the seafloor far below.
 - D. makes it seem as if the *Cramer's* wake is dividing the unbroken expanse of water into two.
14. The passage states that compared to Arizona's Grand Canyon, the canyon that lies within the mountains in Atlantic's basin is considerably:
- F. deeper.
 - G. older.
 - H. wider.
 - J. longer.
15. The main purpose of the information in lines 71–76 is to:
- A. describe in detail scientists' expectations for their first trip to the rift valley.
 - B. characterize the rift valley as an alien, seemingly barren place.
 - C. provide statistics about several geographic properties of the rift valley.
 - D. list the names that scientists gave to the volcanic hills in the rift valley.
16. One of the main purposes of the last paragraph is to state that the:
- F. gashes in the rift valley continue to increase in width.
 - G. seafloor of Atlantic has cooled.
 - H. entire Atlantic seafloor has issued from the gashes in the rift valley.
 - J. volcanoes on Earth's dry land have created the newest, youngest pieces of Atlantic seafloor.
17. The author most strongly implies that people commonly assume the deepest waters of an ocean are:
- A. about one thousand miles offshore.
 - B. at the middle of the ocean.
 - C. dotted with islands.
 - D. located in trenches.
18. As it is used in line 19, the phrase *paid out* most nearly means:
- F. dispensed.
 - G. ascertained.
 - H. suggested.
 - J. compensated.
19. According to the passage, the mountain range in Atlantic's basin covers nearly the same amount of Earth's surface as does:
- A. Mount St. Helens.
 - B. the Himalayas.
 - C. the Pacific Ocean.
 - D. the dry land of continents.
20. According to the passage, the white cover on the peaks of the mountains in Atlantic's basin is:
- F. skeletal remains of microscopic animals.
 - G. thin layers of sedimentary volcanic ash.
 - H. patches of ice.
 - J. salt deposits.



SCIENCE TEST

35 Minutes—40 Questions

DIRECTIONS: There are several passages in this test. Each passage is followed 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.

You are NOT permitted to use a calculator on this test.

Passage I

Researchers studied how diet and the ability to smell food can affect the life span of normal fruit flies (Strain N) and fruit flies unable to detect many odors (Strain X).

Study 1

Three tubes (Tubes 1–3), each with 15% sugar yeast (SY) medium (a diet with 15% sugar and 15% killed yeast), were prepared. Then, 200 virgin female Strain N fruit flies less than 24 hr old were added to each tube. No additional substance was added to Tube 1. Additional odors from live yeast were added to Tube 2, and live yeast was added to Tube 3. The percent of fruit flies alive was determined every 5 days for 75 days (see Figure 1).

Study 2

Three tubes (Tubes 4–6), each with 5% SY medium (a diet with 5% sugar and 5% killed yeast), were prepared. Then, 200 virgin female Strain N fruit flies less than 24 hr old were added to each tube. No additional substance was added to Tube 4. Additional odors from live yeast were added to Tube 5, and live yeast was added to Tube 6. The percent of fruit flies alive was determined every 5 days for 75 days (see Figure 2).

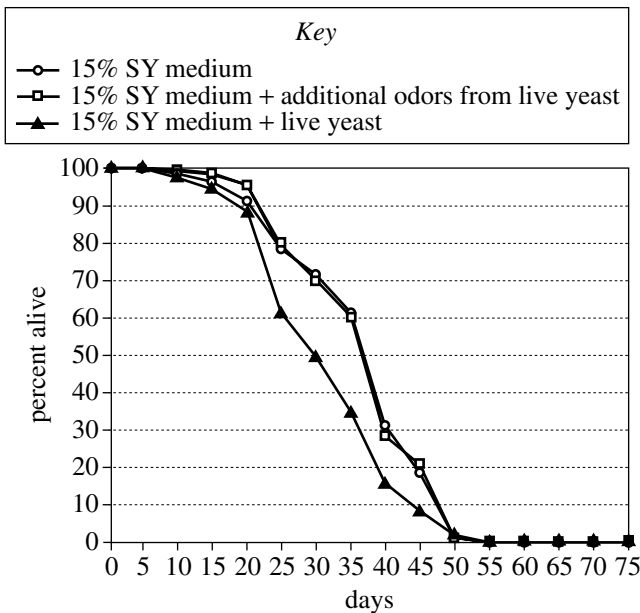


Figure 1

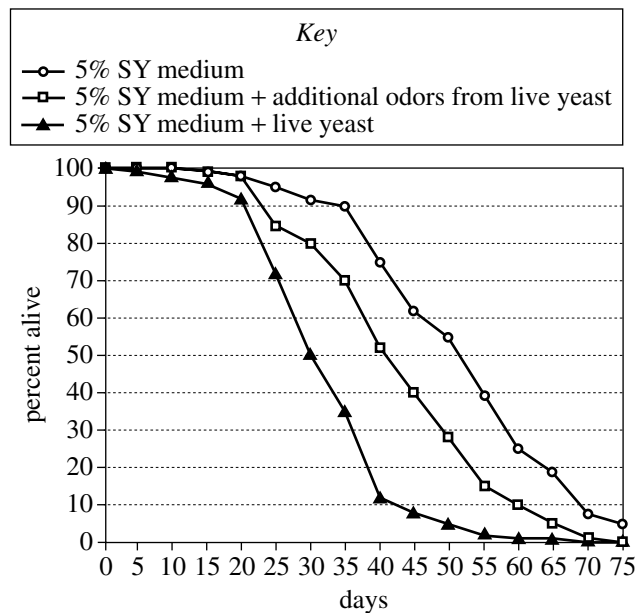


Figure 2

**Study 3**

Strain N fruit flies were modified to produce Strain X fruit flies. Strain X fruit flies lack *Or83b* (a protein required to detect a wide range of odors); therefore, they cannot detect many odors. The average life span was determined for virgin female Strain N and virgin female Strain X fruit flies fed with various SY media (see Table 1).

Strain	SY medium		Average life span (days)
	% sugar	% killed yeast	
Strain N	3	3	50.1
	5	5	50.1
	7.5	7.5	43.9
	10	10	44.8
	15	15	41.6
Strain X	3	3	61.6
	5	5	62.5
	7.5	7.5	58.9
	10	10	58.6
	15	15	55.6

Table and figures adapted from Sergiy Libert et al., "Regulation of *Drosophila* Life Span by Olfaction and Food-Derived Odors." ©2007 by the American Association for the Advancement of Science.

- In which of Studies 1 and 2 did some of the fruit flies live for more than 75 days, and what diet were those fruit flies fed?
 - Study 1; 5% SY medium
 - Study 1; 15% SY medium
 - Study 2; 5% SY medium
 - Study 2; 15% SY medium
- During Studies 1 and 2, why did the size of the fruit fly population in each tube decrease rather than increase?
 - The birthrate was 0, because the initial population contained only males.
 - The birthrate was 0, because the initial population contained only virgin females.
 - The death rate was 0, because the initial population contained only males.
 - The death rate was 0, because the initial population contained only virgin females.
- Study 1 differed from Study 2 in which of the following ways?
 - Female fruit flies were tested in Study 1, whereas male fruit flies were tested in Study 2.
 - Male fruit flies were tested in Study 1, whereas female fruit flies were tested in Study 2.
 - The SY medium tested in Study 1 contained a lower percent of sugar than did the SY medium tested in Study 2.
 - The SY medium tested in Study 1 contained a higher percent of sugar than did the SY medium tested in Study 2.
- Suppose that an additional trial in Study 3 had been performed using a 12% SY medium (a diet with 12% sugar and 12% killed yeast). The average life span of the Strain X fruit flies in this trial would most likely have been:
 - less than 55.6 days.
 - between 55.6 days and 58.6 days.
 - between 58.6 days and 61.6 days.
 - greater than 61.6 days.
- The researchers had predicted that decreasing a fruit fly's ability to detect odors would increase its life span. Are the results of Study 3 consistent with this prediction?
 - No; for each SY medium tested, the average life span of Strain X fruit flies was longer than the average life span of Strain N fruit flies.
 - No; for each SY medium tested, the average life span of Strain N fruit flies was longer than the average life span of Strain X fruit flies.
 - Yes; for each SY medium tested, the average life span of Strain X fruit flies was longer than the average life span of Strain N fruit flies.
 - Yes; for each SY medium tested, the average life span of Strain N fruit flies was longer than the average life span of Strain X fruit flies.
- Suppose the researchers wanted to determine whether a defect in the ability to detect odors would change the life span of fruit flies fed 15% SY medium when live yeast is added to the diet or when additional odors from live yeast are added to the diet. Which of the following experiments should be performed?
 - Repeat Study 1 except with Strain X fruit flies
 - Repeat Study 1 except with Strain N fruit flies
 - Repeat Study 2 except with Strain X fruit flies
 - Repeat Study 2 except with Strain N fruit flies
- The results for which 2 tubes should be compared to determine how a reduced calorie diet affects life span in the absence of live yeast and additional odors from live yeast?
 - Tube 1 and Tube 4
 - Tube 1 and Tube 2
 - Tube 2 and Tube 5
 - Tube 5 and Tube 6

**Passage IV**

In 2 experiments, a student pulled each of 3 blocks in a straight line across a flat, horizontal surface.

In Experiment 1, the student measured the *pulling force* (the force required to move each block at a constant speed) and plotted the pulling force, in newtons (N), versus block mass, in kilograms (kg). The results are shown in Figure 1.

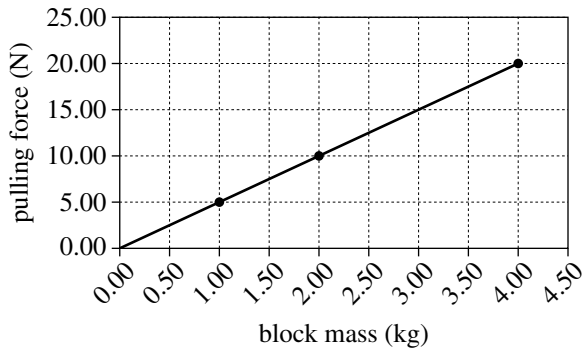


Figure 1

In Experiment 2, the student measured the speed versus time of a 2.00 kg block, a 2.50 kg block, and a 3.00 kg block as each block was pulled across the surface with a constant 30 N force. The results are shown in Figure 2.

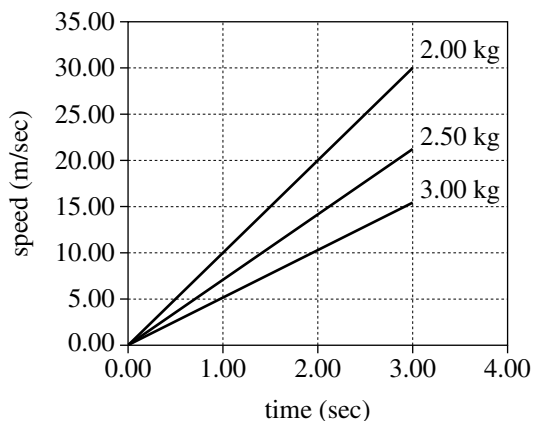


Figure 2

21. If a block was pulled toward the east, the frictional force exerted on the block by the surface was directed toward the:

- A. north.
- B. south.
- C. east.
- D. west.

22. Based on Figure 2, what is the order of the 3 blocks, from the block that required the shortest time to reach 15 m/sec to the block that required the longest time to reach 15 m/sec ?

- F. 2.00 kg block, 2.50 kg block, 3.00 kg block
- G. 2.00 kg block, 3.00 kg block, 2.50 kg block
- H. 3.00 kg block, 2.00 kg block, 2.50 kg block
- J. 3.00 kg block, 2.50 kg block, 2.00 kg block

23. Based on Figure 2, what was the approximate value of the acceleration of the 3.00 kg block?

- A. 0.0 m/sec²
- B. 5.0 m/sec²
- C. 15.0 m/sec²
- D. 20.0 m/sec²

24. Based on Figure 1, the results of Experiment 1 are best modeled by which of the following equations?

- F. Block speed (m/sec) = 0.2 × time (sec)
- G. Block speed (m/sec) = 5.0 × time (sec)
- H. Pulling force (N) = 0.2 × block mass (kg)
- J. Pulling force (N) = 5.0 × block mass (kg)

4**4**

25. At each of the times plotted in Figure 2 (except 0.00 sec), as block mass increased, block speed:

- A. increased only.
- B. decreased only.
- C. varied, but with no general trend.
- D. remained the same.

26. Based on Figure 1, an applied force of 30.00 N would most likely have been required to maintain the constant speed of a block having a mass of:

- F. 4.00 kg.
- G. 5.00 kg.
- H. 6.00 kg.
- J. 7.00 kg.

Practice Writing Test

Your Signature: _____
(Do not print.)

Print Your Name Here: _____

Your Date of Birth:									
<input type="text"/>	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Month			Day			Year			

Form 15AA51

The **ACT**[®]

WRITING TEST BOOKLET

You must take the multiple-choice tests before you take the writing test.

Directions

This is a test of your writing skills. You will have **forty** (40) minutes to read the prompt, plan your response, and write an essay in English. Before you begin working, read all material in this test booklet carefully to understand exactly what you are being asked to do.

You will write your essay on the lined pages in the **answer document** provided. Your writing on those pages will be scored. You may use the unlined pages in this test booklet to plan your essay. Your work on these pages will not be scored.

Your essay will be evaluated based on the evidence it provides of your ability to:

- analyze and evaluate multiple perspectives on a complex issue
- state and develop your own perspective on the issue
- explain and support your ideas with logical reasoning and detailed examples
- clearly and logically organize your ideas in an essay
- effectively communicate your ideas in standard written English

Lay your pencil down immediately when time is called.

DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO.

ACT[®]

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Iowa City, IA 52243-0168

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Public Health and Individual Freedom

Most people want to be healthy, and most people want as much freedom as possible to do the things they want. Unfortunately, these two desires sometimes conflict. For example, smoking is prohibited from most public places, which restricts the freedom of some individuals for the sake of the health of others. Likewise, car emissions are regulated in many areas in order to reduce pollution and its health risks to others, which in turn restricts some people's freedom to drive the vehicles they want. In a society that values both health and freedom, how do we best balance the two? How should we think about conflicts between public health and individual freedom?

Read and carefully consider these perspectives. Each suggests a particular way of thinking about the conflict between public health and individual freedom.

Perspective One

Our society should strive to achieve the greatest good for the greatest number of people. When the freedom of the individual interferes with that principle, freedom must be restricted.

Perspective Two

Nothing in society is more valuable than freedom. Perhaps physical health is sometimes improved by restricting freedom, but the cost to the health of our free society is far too great to justify it.

Perspective Three

The right to avoid health risks is a freedom, too. When we allow individual behavior to endanger others, we've damaged both freedom and health.

Essay Task

Write a unified, coherent essay in which you evaluate multiple perspectives on the conflict between public health and individual freedom. In your essay, be sure to:

- analyze and evaluate the perspectives given
- state and develop your own perspective on the issue
- explain the relationship between your perspective and those given

Your perspective may be in full agreement with any of the others, in partial agreement, or wholly different. Whatever the case, support your ideas with logical reasoning and detailed, persuasive examples.

Planning Your Essay

Your work on these prewriting pages will not be scored.

Use the space below and on the back cover to generate ideas and plan your essay. You may wish to consider the following as you think critically about the task:

Strengths and weaknesses of the three given perspectives

- What insights do they offer, and what do they fail to consider?
- Why might they be persuasive to others, or why might they fail to persuade?

Your own knowledge, experience, and values

- What is your perspective on this issue, and what are its strengths and weaknesses?
- How will you support your perspective in your essay?

Note

- For your practice essay, you will need scratch paper to plan your essay and four lined sheets of paper for your response.
- On test day, you will receive a test booklet with space to plan your essay and four lined pages on which to write your response.
- Read pages 61–62 for information and instructions on scoring your practice writing test.

ACT MINI-TEST QUESTIONNAIRE

Please complete the following short questionnaire about the ACT mini-test:

ENGLISH	I felt confident on the English section	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
	In one to two sentences, describe how you feel about the English section:					
MATH	I <u>once</u> knew the content on the Math section, but I have forgotten some of it	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
	I <u>currently</u> know all of the content on the Math section	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
	In one to two sentences, describe how you feel about the <u>Math</u> section:					
READING	I felt confident on the Reading section	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
	In one to two sentences, describe how you feel about the Reading section:					
SCIENCE	I felt confident on the Science section	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
	In one to two sentences, describe how you feel about the Science section:					
ESSAY	I know how I would answer the essay prompt	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
OVERALL	Compared to other standardized tests I have taken (MCAS, PSAT, SAT, etc...) I found the ACT to be:	Much Better	Somewhat Better	About the same	Somewhat Worse	Much Worse
	In two to three sentences, describe how you feel about the test overall ?					

