OLYMPIADS SCHOOL - SAT PREP - HOMEWORK 9

NAME (FIRST AND LAST):___________________________________

DAY, TIME, TEACHER:______________________________________

From the College Board study guide

> Each version of the Reading Test includes one set of two or more topically related informational passages on a subject in either history/social studies or science. We'll call all of these "paired passages" because in most cases there will be two passages in a set — one labeled Passage 1 and the other Passage 2. These pairings are chosen carefully to ensure that the passages are similar enough that meaningful connections can be drawn between the two.
>
> As discussed earlier, the two passages may present opposing positions on the same issue, but it's more likely that the second passage will "respond" to the first in some more general way. The second passage may, for instance, provide a more detailed explanation of an idea that's only touched on in the first passage, or it may offer a practical application of a theoretical concept discussed in the first passage. The two passages will be different enough in content that you should be able to remember who said what if you've read them both carefully, but, as always, you can refer to the test book as often as you like and use notations such as underlines, numbers, and arrows if this will help you keep the two passages straight in your mind.

Instructions for this week's homework:

1. Complete the "paired passages" exercise included in the package. Even though the questions come from an "old" SAT textbook (Barron's 2012), the same skills are assessed.
2. Complete the vocabulary exercise.

The questions that follow the next two passages relate to the content of both, and to their relationship. The correct response may be stated outright in the passage or merely suggested.

Questions 7–19 are based on the following passages.

The following passages deal with the exotic world of subatomic physics. Passage 1, written by a popularizer of contemporary physics, was published in 1985. Passage 2 was written nearly 15 years later.

Passage 1

The classical idea of matter was something with solidity and mass, like wet stone dust pressed in a fist. If matter was composed of atoms, then the atoms too must have solidity and mass. At the beginning of the twentieth century the atom was imagined as a tiny billiard ball or a granite pebble writ small. Then, in the physics of Niels Bohr, the miniature billiard ball became something akin to a musical instrument, a finely tuned Stradivarius 10 billion times smaller than the real thing. With the advent of quantum mechanics, the musical instrument gave way to pure music. On the atomic scale, the solidity and mass of matter dissolved into something light and airy. Suddenly physicists were describing atoms in the vocabulary of the composer—"resonance," "frequency," "harmony," "scale." Atomic electrons sang in choirs like seraphim, cherubim, thrones, and dominions. Classical distinctions between matter and light became muddled. In the new physics, light bounced about like particles, and matter undulated in waves like light.

In recent decades, physicists have uncovered elegant subatomic structures in the music of matter. They use a strange new language to describe the subatomic world: *quark, squark, gluon, gauge, technicolor, flavor, strangeness, charm*. There are *up* quarks and *down* quarks, *top* quarks and *bottom* quarks. There are particles with *truth* and *antitruth*, and there are particles with *naked beauty*. The simplest of the constituents of ordinary matter—the proton, for instance—has taken on the character of a Bach fugue, a four-part counterpoint of matter, energy, space, and time. At matter's heart there are arpeggios, chromatics, syncopation. On the lowest rung of the chain of being, Creation dances.

Already, the astronomers and the particle physicists are engaged in a vigorous dialogue. The astronomers are prepared to recognize that the large-scale structure of the universe may have been determined by subtle interactions of particles in the first moments of the Big Bang. And the particle physicists are hoping to find confirmation of their theories of subatomic structure in the astronomers' observations of deep space and time. The snake has bitten its tail and won't let go.

Passage 2

Consider a dew drop, poised at the tip of a grass blade. Only one millimeter in diameter, this tiny dew drop is composed of a billion trillion molecules of water, each consisting of two hydrogen atoms and one oxygen atom (H_2O). At the onset of the twentieth century, this was the accepted view of the nature of matter. Atoms were seen as matter's basic building blocks, elementary or fundamental particles that could not be divided into anything smaller.

This relatively simple picture, however, changed drastically as physicists came to explore the secrets of the subatomic world. The once-indivisible atom, split, was revealed to consist of a nucleus made up of protons and neutrons around which electrons orbited. Protons and neutrons, in turn, were composed of even smaller subatomic particles whimsically dubbed quarks. At first, theorists claimed that all matter was made of three fundamental particles: electrons and paired up and down quarks. Later, however, experiments with powerful accelerators and colliding particle beams suggested the existence of other pairs of quarks, three generations in all, whose mass increased with each generation. Lightest of all were the first generation quarks, up and down, which combined to create the basic protons and neutrons; somewhat heavier were the second generation quarks, strange and charm, the building blocks of the more esoteric particles produced in the physicists' labs. Then in 1977 a team headed by Fermilab physicist Leon Lederman uncovered the possibility of a third generation of quarks. Using new accelerators with higher energies, they produced a short-lived heavy particle, the upsilon, whose properties suggested it could not be made of the four quarks then known. They concluded it must be made of a fifth quark, which they named bottom, whereupon scientists throughout the world set off in hot pursuit of bottom's hypothetical partner, top.

GO ON TO THE NEXT PAGE

8 8 8 8 8 8 8 8 8 8 8

The hunt for the top quark consumed the world's particle physicists for nearly twenty years. It was their Grail, and they were as determined as any knight of King Arthur's court to succeed in their holy quest. To Harvard theorist Sheldon Glashow in 1994, it was "not just another quark. It's the last blessed one, and the sooner we find it, the better everyone will feel." Indeed, they had to find it, for the Standard Model of particle physics, the theoretical synthesis that reduced the once-maddening hordes of particles (the so-called "particle zoo") to just a few primary components, hinged upon its existence. Physicists likened the missing quark to the keystone of an arch: the Standard Model, like an arch, was supported by all its constituents, but it was the keystone, the last piece to go in, that ensured the structure's stability.

In 1995 the physicists found the keystone to their arch, and with it, new questions to answer. Surprisingly the top quark was far heavier than theorists had predicted, nearly twice as heavy in fact. Fermilab physicist Alvin Tollestrup originally had estimated top to weight at least as much as a silver atom. At the hunt's end, top was determined to have a mass similar to that of an atom of gold. (With an atomic weight of 197, a gold atom is made up of hundreds of up and down quarks.) The question thus remains, why is top so massive? Why does any fundamental particle have mass? With its astonishing heft, the top quark should help clarify the hidden mechanisms that make some particles massive while others have no mass at all.

7. The author of Passage 1 refers to quarks, squarks, and charms (paragraph 2) primarily in order to
   (A) demonstrate the similarity between these particles and earlier images of the atom
   (B) make a distinction between appropriate and inappropriate terms
   (C) object to suggestions of similar frivolous names
   (D) provide examples of idiosyncratic nomenclature in contemporary physics
   (E) cite preliminary experimental evidence supporting the existence of subatomic matter

8. The author's tone in the second paragraph of Passage 1 can best be described as one of
   (A) scientific detachment
   (B) moderate indignation
   (C) marked derision
   (D) admiring wonder
   (E) qualified skepticism

9. "Matter's heart" mentioned in line 35 is
   (A) outer space
   (B) the subatomic world
   (C) the language of particle physics
   (D) harmonic theory
   (E) flesh and blood

10. The final paragraph of Passage 1 indicates that the author regards the talks between the astronomers and the particle physicists as
    (A) contentious
    (B) unrealistic
    (C) spirited
    (D) distracting
    (E) poetic

11. In line 47, the image of the snake biting its tail is used to emphasize
    (A) the dangers of circular reasoning
    (B) the vigor inherent in modern scientific dialogue
    (C) the eventual triumph of the classical idea of matter
    (D) the unity underlying the astronomers' and particle physicists' theories
    (E) the ability of contemporary scientific doctrine to swallow earlier theories

12. In line 83, "properties" most nearly means
    (A) lands
    (B) titles
    (C) investments
    (D) civilities
    (E) characteristics

GO ON TO THE NEXT PAGE

13. Glashow's comment in lines 94–96 reflects his
    (A) apprehension
    (B) impatience
    (C) imagination
    (D) jubilation
    (E) spirituality

14. The references to the "keystone" of an arch (lines 103 and 105) serve to
    (A) diminish the top quark's status to that of a commodity
    (B) provide an accurate physical description of the elusive particle
    (C) highlight the contrast between appearance and reality
    (D) give an approximation of the top quark's actual mass
    (E) illustrate the importance of the top quark to subatomic theory

15. In line 101, "hinged" most nearly means
    (A) folded
    (B) vanished
    (C) remarked
    (D) depended
    (E) weighed

16. The author of Passage 2 does all of the following EXCEPT
    (A) cite an authority
    (B) use a simile
    (C) define a term
    (D) pose a question
    (E) deny a possibility

17. The author of Passage 2 mentions the gold atom (lines 114 and 115) primarily to
    (A) clarify the monetary value of the top quark
    (B) explain what is meant by atomic weight
    (C) illustrate how hefty a top quark is compared to other particles
    (D) suggest the sorts of elements studied in high-energy accelerators
    (E) demonstrate the malleability of gold as an element

18. As Passage 2 suggests, since the time Passage 1 was written, the Standard Model has
    (A) determined even more whimsical names for the subatomic particles under discussion
    (B) taken into account the confusion of the particle physicists
    (C) found theoretical validation through recent experiments
    (D) refuted significant aspects of the Big Bang theory of the formation of the universe
    (E) collapsed for lack of proof of the existence of top quarks

19. The author of Passage 2 would most likely react to the characterization of the constituents of matter in lines 31–37 by pointing out that
    (A) this characterization has been refuted by prominent physicists
    (B) the characterization is too fanciful to be worthwhile
    (C) the most recent data on subatomic particles support this characterization
    (D) this characterization supersedes the so-called Standard Model
    (E) the current theoretical synthesis is founded on this characterization

YOU MAY GO BACK AND REVIEW THIS SECTION IN THE REMAINING TIME, BUT DO NOT WORK IN ANY OTHER SECTION UNTIL TOLD TO DO SO.

STOP

INSTRUCTIONS

1) **Annotate every paragraph. Make use of the margins.**
2) **In your annotation for each paragraph, use strong verbs (e.g., represents, emphasizes, problematizes, suggests etc.) that are truly representative of the writer's purpose. Vary your verb choices.**
3) **Write only the introduction and the first body paragraph.**
4) **Ensure that you maintain parallel structure in your thesis statement.**
5) **Be as specific as you can when you write your thesis statement.**
6) **In fact, be as specific as you can for every sentence that you write. Instead of saying "The writers highlight X, which adds power to their writing," be precise in the way you describe the addition of power. Try: "The writers highlight X, which reinforces their robust argument about Y." What is Y? Be specific!**

As you read the passage below, consider how Lawrence Norden and Christopher Famighetti use

- evidence, such as facts or examples, to support claims.
- reasoning to develop ideas and to connect claims and evidence.
- stylistic or persuasive elements, such as word choice or appeals to emotion, to add power to the ideas expressed.

Adapted from Lawrence Norden and Christopher Famighetti, "Aging Voting Machines Are a Threat to Democracy." ©2015 by TheHuffingtonPost.com, Inc. Originally published September 28, 2015.

1 [I]t should not be difficult to rally our elected leaders to remedy an eminently fixable problem threatening our democracy: the looming crisis resulting from our nation's outdated voting machines.

2 In the vast majority of states, aging voting machines are approaching the end of their useful lives. To continue to use this equipment past its projected lifespan could be disastrous. After years of wear-and-tear, machine parts like motherboards, memory cards, and touch screens begin to fail. When this happens on Election Day, machines must be taken out of service. Voters can be forced to wait in line—sometimes for hours—while repairs are made or machines substituted.

3 This can only shake confidence in the electoral process, and in worst case scenarios can impact election results. In the 2012 election, according [to] a study by political scientists from Harvard and MIT, between 500,000 and 700,000 votes were lost nationally because of long lines. Absent action to replace or upgrade machines, this problem will only grow worse.

4 A little history is in order. After the 2000 presidential election debacle, involving “hanging chads”[1] on paper ballots in Florida, Congress passed a law allocating more than $2 billion to the states to replace obsolete voting equipment. By 2006, the vast majority of election jurisdictions had deployed new machines.

5 Voting system experts agree that most machines purchased since 2000 have a projected lifespan of between 10 and 15 years. Today, 43 states are using systems that will be at least 10 years old in 2016; 14 are using machines that will be at least 15 years old. No one expects a laptop computer to last for 10 years. It is wrong to expect these electronic voting machines, many of which use laptop technology from the 1990s, to last much longer.

6 For a high-profile example of what can go wrong with antiquated machines consider Virginia’s 2014 election. Following reports of machines crashing or registering votes incorrectly, the state Board of Elections commissioned an expert review to look at 27 malfunctioning touch screen machines. In 26 of them, they found the glue holding the touch screens in place had degraded, knocking them out of alignment so votes were not recorded properly. That problem may not be limited to Virginia. The same model of this antiquated machine is still used in 20 states.

7 Security is another problem with older machines. In a related investigation, looking at a different machine, Virginia investigators found wireless cards that could allow “an external party to access the [machine] and modify the data without notice from a nearby location.”

8 In the years since those machines were purchased, much has been learned about how to design voting systems that are more user friendly and accessible to all. We have developed techniques that can audit the count of paper ballots, to ensure that the software on new machines is correctly tallying votes.

9 As it is, maintaining the outdated machines used today is often a struggle. As voting systems age, the parts necessary to support them go out of production. Some election officials have to resort to finding parts on eBay. . . .

10 Even in the absence of new machines, there are important steps that states and counties can take in the next several months to reduce failures or minimize their impact on voting next November. Officials should test every voting machine before Election Day to catch problems ahead of time. Training poll workers on how to deal with machine problems is also critical. Poll workers who know what to do in case of machine problems can make the difference between a major Election Day fiasco and a brief delay.

11 Of course, the fragile state of voting machines is no secret to those election officials who need to replace them. What too many lack is the money to do so.

12 Congress has a role to play. As it did 13 years ago, Washington should provide an infusion of money to help purchase new machines. But today, few in Congress of either party are talking about this problem. Realistically, given how soon action needs to be taken, states are going to have to provide the majority of funds. At a moment of intense budget pressures, replacing all of the aging machines will not be cheap—the total cost could easily reach $1 billion nationwide. But even in tough budget times, this is an essential investment. The mechanics of democracy are too important to rely on outdated systems that are increasingly prone to failure.

13

- [1] In the 2000 presidential election, small pieces of paper that were incompletely detached from the ballot, called “hanging chads,” made it difficult to determine for whom a vote had been cast.

Write an essay in which you explain how Lawrence Norden and Christopher Famighetti build an argument to persuade their audience that outdated voting machines must be replaced. In your essay, analyze how Norden and Famighetti use one or more of the features listed in the box above (or features of your own choice) to strengthen the logic and persuasiveness of their argument. Be sure that your analysis focuses on the most relevant features of the passage.

Your essay should not explain whether you agree with Norden and Famighetti’s claims, but rather explain how Norden and Famighetti build an argument to persuade their audience.

INTRODUCTION AND FIRST BODY PARAGRAPH ONLY:

THE END