

READING PASSAGE 2

You should spend about 20 minutes on **Questions 17–27**, which are based on Reading Passage 2 below.

The atom bomb was one of the defining inventions of the 20th Century. So how did science fiction writer HG Wells predict its invention three decades before the first detonations?

(A) Imagine you're the greatest fantasy writer of your age. One day you dream up the idea of a bomb of infinite power. You call it the "atomic bomb". HG Wells first imagined a uranium-based hand grenade that "would continue to explode indefinitely" in his 1914 novel *The World Set Free*. He even thought it would be dropped from planes. What he couldn't predict was how a strange conjunction of his friends and acquaintances - notably Winston Churchill, who'd read all Wells's novels twice, and the physicist Leo Szilard - would turn the idea from fantasy to reality, leaving them deeply tormented by the scale of destructive power that it unleashed.

(B) The story of the atom bomb starts in the Edwardian age, when scientists such as Ernest Rutherford were grappling with a new way of conceiving the physical world. The idea was that solid elements might be made up of tiny particles in atoms. "When it became apparent that the Rutherford atom had a dense nucleus, there was a sense that it was like a coiled spring," says Andrew Nahum, curator of the Science Museum's Churchill's Scientists exhibition. Wells was fascinated with the new discoveries. He had a track record of predicting technological innovations. Winston Churchill credited Wells for coming up with the idea of using aeroplanes and tanks in combat ahead of World War One.

(C) The two men met and discussed ideas over the decades, especially as Churchill, a highly popular writer himself, spent the interwar years out of political power, contemplating the rising instability of Europe. Churchill grasped the danger of technology running ahead of human maturity, penning a 1924 article in the *Pall Mall Gazette* called "Shall we all commit suicide?". In the article, Churchill wrote: "Might a bomb no bigger than an orange be found to possess a secret power to destroy a whole block of buildings - nay to concentrate the force of a thousand tons of cordite and blast a township at a

stroke?" This idea of the orange-sized bomb is credited by Graham Farmelo, author of *Churchill's Bomb*, directly to the imagery of *The World Set Free*.

(D) By 1932 British scientists had succeeded in splitting the atom for the first time by artificial means, although some believed it couldn't produce huge amounts of energy. But the same year the Hungarian emigre physicist Leo Szilard read *The World Set Free*. Szilard believed that the splitting of the atom could produce vast energy. He later wrote that Wells showed him "what the liberation of atomic energy on a large scale would mean". Szilard suddenly came up with the answer in September 1933 - the chain reaction - while watching the traffic lights turn green in Russell Square in London. He wrote: "It suddenly occurred to me that if we could find an element which is split by neutrons and which would emit two neutrons when it absorbed one neutron, such an element, if assembled in sufficiently large mass, could sustain a nuclear chain reaction."

(E) In that eureka moment, Szilard also felt great fear - of how a bustling city like London and all its inhabitants could be destroyed in an instant as he reflected in his memoir published in 1968:

"Knowing what it would mean - and I knew because I had read HG Wells - I did not want this patent to become public." The Nazis were on the rise and Szilard was deeply anxious about who else might be working on the chain reaction theory and an atomic Bomb. Wells's novel *Things To Come*, turned into a 1936 film, *The Shape of Things to Come*, accurately predicted aerial bombardment and an imminent devastating world war. In 1939 Szilard drafted the letter Albert Einstein sent to President Roosevelt warning America that Germany was stockpiling uranium. The Manhattan Project was born.

(F) Szilard and several British scientists worked on it with the US military's massive financial backing. Britons and Americans worked alongside each other in "silos" - each team unaware of how their work fitted together. They ended up moving on from the original enriched uranium "gun" method, which had been conceived in Britain, to create a plutonium implosion weapon instead. Szilard campaigned for a demonstration bomb test in front of the Japanese ambassador to give them a chance to surrender. He was horrified that it was instead dropped on a city. In 1945 Churchill was beaten in the general election and in another shock, the US government passed the 1946 McMahon Act, shutting Britain out of access to the atomic technology it had helped create. William Penney, one of the returning Los Alamos physicists, led the team charged by Prime Minister Clement Atlee with somehow putting together their individual pieces of the puzzle to create a British bomb on a fraction of the American budget.

(G) "It was a huge intellectual feat," Andrew Nahum observes. "Essentially they reworked the calculations that they'd been doing in Los Alamos. They had the services of Klaus Fuchs, who [later] turned out to be an atom spy passing information to the Soviet Union, but he also had a phenomenal memory." Another British physicist, Patrick Blackett, who discussed the Bomb after the war with a German scientist in captivity, observed that there were no real secrets. According to Nahum he said: "It's a bit like making an omelette. Not everyone can make a good one." When Churchill was re-elected in 1951 he "found an almost complete weapon ready to test and was puzzled and fascinated by how Atlee had buried the costs in the budget", says Nahum. "He was very conflicted about whether to go ahead with the test and wrote about whether we should have 'the art and not the article'. Meaning should it be enough to have the capability... [rather] than to have a dangerous weapon in the armoury."

(H) Churchill was convinced to go ahead with the test, but the much more powerful hydrogen bomb developed three years later worried him greatly. HG Wells died in 1946. He had been working on a film sequel to *The Shape of Things To Come* that was to include his concerns about the now-realised atomic bomb he'd first imagined. But it was never made. Towards the end of his life, says Nahum, Wells's friendship with Churchill "cooled a little". "Wells considered Churchill as an enlightened but tarnished member of the ruling classes." And Churchill had little time for Wells's increasingly fanciful socialist utopian ideas.

(I) Wells believed technocrats and scientists would ultimately run a peaceful new world order like in *The Shape of Things To Come*, even if global war destroyed the world as we knew it first. Churchill, a former soldier, believed in the lessons of history and saw diplomacy as the only way to keep mankind from self-destruction in the atomic age. Wells's scientist acquaintance Leo Szilard stayed in America and campaigned for civilian control of atomic energy, equally pessimistic about Wells's idea of a bold new scientist-led world order. If anything Szilard was tormented by the power he had helped unleash. In 1950, he predicted a cobalt bomb that would destroy all life on the planet. In Britain, the legacy of the Bomb was a remarkable period of elite scientific innovation as the many scientists who had worked on weaponry or radar returned to their civilian labs. They gave us the first commercial jet airliner, the Comet, near-supersonic aircraft and rockets, highly engineered computers, and the Jodrell Bank giant moveable radio telescope.

(J) The latter had nearly ended the career of its champion, physicist Bernard Lovell, with its huge costs, until the 1957 launch of Sputnik, when it

emerged that Jodrell Bank had the only device in the West that could track it. Nahum says Lovell reflected that "during the war the question was never what will something cost. The question was only can you do it and how soon can we have it? And that was the spirit he took into his peacetime science." Austerity and the tiny size of the British market, compared with America, were to scupper those dreams. But though the Bomb created a new terror, for a few years at least, Britain saw a vision of a benign atomic future, too and believed it could be the shape of things to come.

Questions 17–25

Reading Passage 2 has ten paragraphs, **A–J**.

Which paragraph contains the following information?

Write the correct letter, **A–J**, in boxes 17–25 on your answer sheet. Note that one paragraph is not used.

- 17. Scientific success
- 18. Worsening relations
- 19. The dawn of the new project
- 20. Churchill's confusion
- 21. Different perspectives
- 22. Horrifying prediction
- 23. Leaving Britain behind the project
- 24. Long-term discussion
- 25. New idea

Scientists Are Mapping the World's Largest Volcano

(A) After 36 days of battling sharks that kept biting their equipment, scientists have returned from the remote Pacific Ocean with a new way of looking at the world's largest - and possibly most mysterious - volcano, Tamu Massif.

(B) The team has begun making 3-D maps that offer the clearest look yet at the underwater mountain, which covers an area the size of New Mexico. In the coming months, the maps will be refined and the data analyzed, with the ultimate goal of figuring out how the mountain was formed.

(C) It's possible that the western edge of Tamu Massif is actually a separate mountain that formed at a different time, says William Sager, a geologist at the University of Houston who led the expedition. That would explain some differences between the western part of the mountain and the main body.

(D) The team also found that the massif (as such a massive mountain is known) is highly pockmarked with craters and cliffs. Magnetic analysis provides some insight into the mountain's genesis, suggesting that part of it formed through steady releases of lava along the intersection of three mid-ocean ridges, while part of it is harder to explain. A working theory is that a large plume of hot mantle rock may have contributed additional heat and material, a fairly novel idea.

(E) Tamu Massif lies about 1,000 miles (1,600 kilometers) east of Japan. It is a rounded dome, or shield volcano, measuring 280 by 400 miles (450 by 650 kilometers). Its top lies more than a mile (about 2,000 meters) below the ocean surface and is 50 times larger than the biggest active volcano on Earth, Hawaii's Mauna Loa. Sager published a paper in 2013 that said the main rise of Tamu Massif is most likely a single volcano, instead of a complex of multiple volcanoes that smashed together. But he couldn't explain how something so big formed.

(F) The team used sonar and magnetometers (which measure magnetic fields) to map more than a million square kilometers of the ocean floor in great detail. Sager and students teamed up with Masao Nakanishi of Japan's Chiba University, with Sager receiving funding support from the National Geographic Society and the Schmidt Ocean Institute.

(G) Since sharks are attracted to magnetic fields, the toothy fish "were all over our magnetometer, and it got pretty chomped up," says Sager. When the team replaced the device with a spare, that unit was nearly ripped off by more

sharks. The magnetic field research suggests the mountain formed relatively quickly, sometime around 145 million years ago. Part of the volcano sports magnetic "stripes," or bands with different magnetic properties, suggesting that lava flowed out evenly from the mid-ocean ridges over time and changed in polarity each time Earth's magnetic field reversed direction. The central part of the peak is more jumbled, so it may have formed more quickly or through a different process.

(H) Sager isn't sure what caused the magnetic anomalies yet, but suspects more complex forces were at work than simply eruptions from the ridges. It's possible a deep plume of hot rock from the mantle also contributed to the volcano's formation, he says. Sager hopes the analysis will also help explain about a dozen other similar features on the ocean floor, as well as add to the overall understanding of plate tectonics.

Questions 1-8

Reading Passage 1 has eight paragraphs, **A-H**.

What paragraph has the following information? Write the correct letter, **A-H**, in boxes 1-8 on your answer sheet.

1. Possible explanation of the differences between parts of the mountain

2. Size data

3. A new way of looking

4. Problem with sharks

5. Uncertainty of the anomalies

6. Equipment which measures magnetic fields

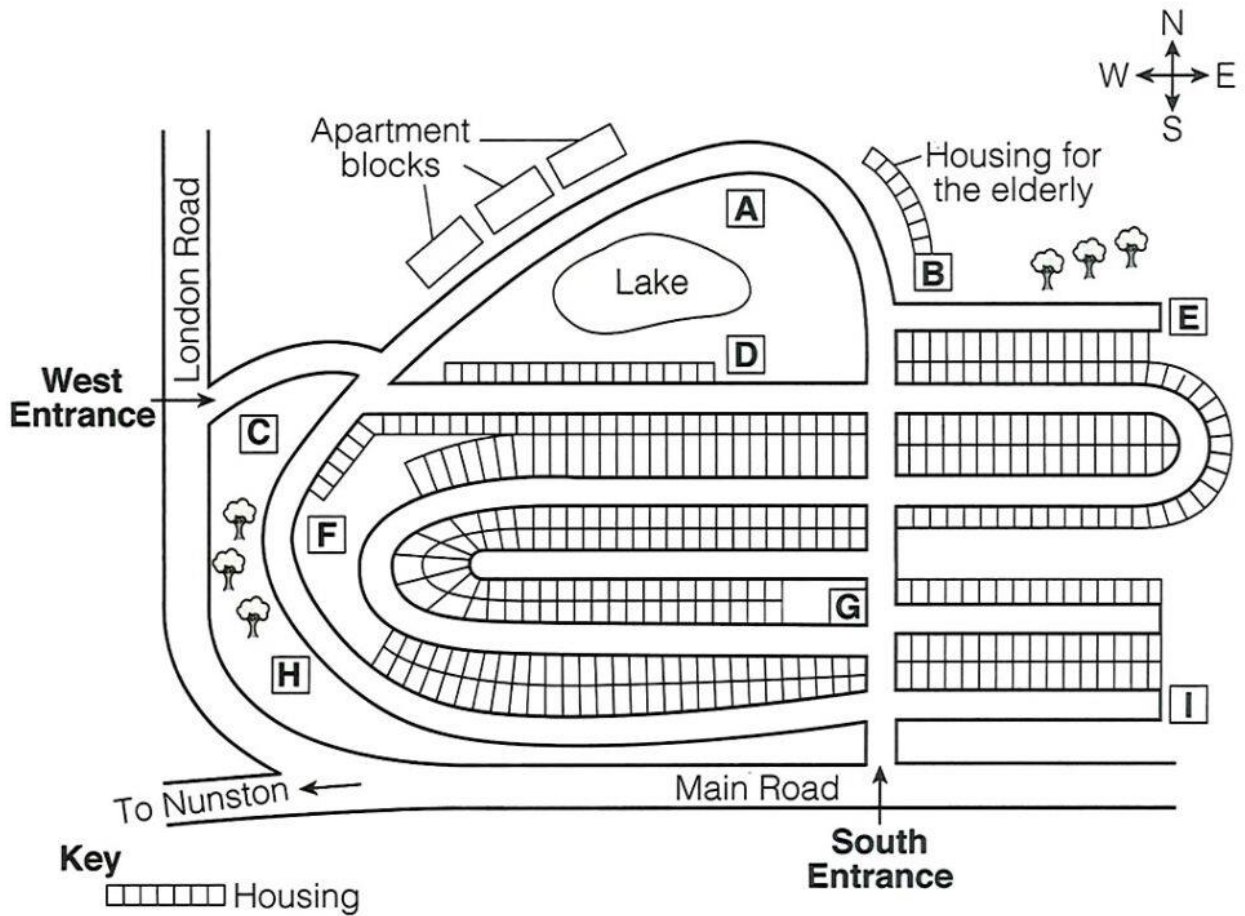
7. The start of making maps

8. A working theory

Questions 15-20

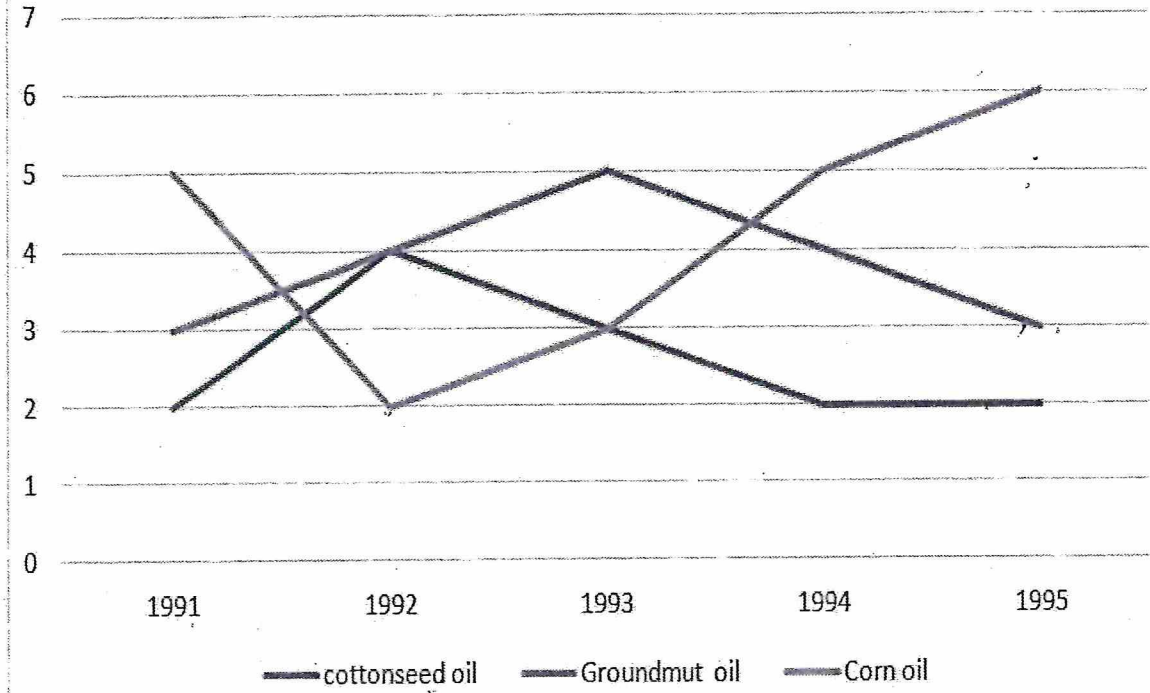
Label the map below.

Write the correct letter, **A-I**, next to Questions 15-20.



- 15 School
- 16 Sports centre
- 17 Clinic
- 18 Community centre
- 19 Supermarket
- 20 Playground

Consumption oil



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Tense used in line graph:

Past tense

Active: verb form 2

Passive: was/were+v3 + by

Adjective + verb

Verb+ adverb (ly)

Introduction:

The assigned line graph illustrates the information about the consumption of three distinct sorts of oil; namely cottonseed oil, groundnut oil and corn oil per person per year.

Overall:

It is crystal clear that the use of corn oil showed an increasing trend. However, cottonseed oil and groundnut oil's usage experienced a static trend.

Sentence formations for data depictions:

___ litres of groundnut oil was used by per person per year in 1991.

Whereas, it reached at near ___ litres after a year. Before remaining identical, it faced a drastic drop from 1992 to 1994.

Describing Trends

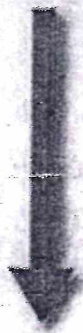
Verbs to describe

rise
jump
grow
climb
go up
increase
soar

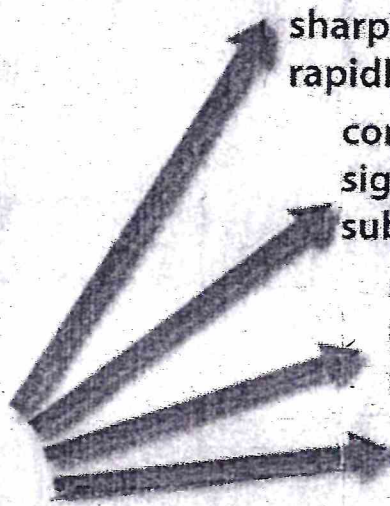


Verbs to describe

fall
drop
decline
decrease
go down
plunge
plummet



Adverbs to describe... HOW?



sharply quickly
rapidly steeply
considerably
significantly
substantially
steadily
gradually
moderately
slightly
slowly

How to describe



stay
remain

+

constant
steady
stable

FREEZON LEVELHOFF

UNIT 6 AED

Line graph

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The assigned line graph illustrates the information about the consumption of three distinct sorts of oil, namely cottonseed oil, groundnut oil and corn oil per person per year.

Overall, it is crystal clear that the use of corn oil showed an increasing trend. However, cottonseed oil and groundnut oil's usage experienced a static trend.

To begin with, 2 litres of groundnut oil was used by per person per year in 1991, whereas, it reached at near 4 litres after a year. Before remaining identical, it faced a drastic drop from 1992 to 1994. In 1991, the consumption of cottonseed oil was 3 litres which grew to about 5 litres in 1993. But it decreased slightly by 3 litres in eventual year. The utilization of corn oil per individual was 5 litres in initial year and took a nose dive in next year, recorded as 2 litres. Whereas, despite experiencing some fluctuations, it hit the peak point, stood at 6 litres in last year.

The power of the big screen



A The Lumière Brothers opened their Cinématographe, at 14 Boulevard des Capucines in Paris, to 100 paying customers over 100 years ago, on December 8, 1895. Before the eyes of the stunned, thrilled audience, photographs came to life and moved across a flat screen.

B So ordinary and routine has this become to us that it takes a determined leap of the imagination to grasp the impact of those first moving images. But it is worth trying, for to understand the initial shock of those images is to understand the extraordinary power and magic of cinema, the unique, hypnotic quality that has made film the most dynamic, effective art form of the 20th century.

C One of the Lumière Brothers' earliest films was a 30-second piece which showed a section of a railway platform flooded with sunshine. A train appears and heads straight for the camera. And that is all that happens. Yet the Russian director Andrei Tarkovsky, one of the greatest of all film artists, described the film as a 'work of genius'. 'As the train approached,' wrote Tarkovsky, 'panic started in the theatre: people jumped and ran away. That was the moment when cinema was born.'

The frightened audience could not accept that they were watching a mere picture. Pictures were still, only reality moved; this must, therefore, be reality. In their confusion, they feared that a real train was about to crush them.'

D Early cinema audiences often experienced the same confusion. In time, the idea of film became familiar, the magic was accepted -but it never stopped being magic. Film has never lost its unique power to embrace its audiences and transport them to a different world. For Tarkovsky, the key to that magic was the way in which cinema created a dynamic image of the real flow of events. A still picture could only imply the existence of time, while time in a novel passed at the whim of the reader. But in cinema, the real, objective flow of time was captured.

E One effect of this realism was to educate the world about itself. For cinema makes the world smaller. Long before people travelled to America or anywhere else, they knew what other places looked like; they knew how other people worked and lived. Overwhelmingly, the lives recorded - at least in film fiction — have been American. From the earliest days of the industry, Hollywood has dominated the world film market. American imagery - the cars, the cities, the cowboys - became the primary imagery of film. Film carried American life and values around the globe.

F And, thanks to film, future generations will know the 20th century more intimately than any other period. We can only imagine what life was like in the 14th century or in classical Greece. But the life of the modern world has been recorded on film in massive, encyclopaedic detail. We shall be known better than any preceding generations.

G The 'star' was another natural consequence of cinema. The cinema star was effectively born in 1910. Film personalities have such an immediate presence that, inevitably, they become super-real. Because we watch them so closely and because everybody in the world seems to know who they are, they appear more real to us than we do ourselves. The star as magnified human self is one of cinema's most strange and enduring legacies.

H Cinema has also given a new lease of life to the idea of the story. When the Lumière Brothers and other pioneers began showing off this new invention, it was by no means obvious how it would be used. All that mattered at first was the wonder of movement. Indeed, some said that, once this novelty had worn off, cinema would fade away. It was no more than a passing gimmick, a fairground attraction.

I Cinema might, for example, have become primarily a documentary form. Or it might have developed like television - as a strange, noisy transfer of music, information and narrative. But what happened was that it became, overwhelmingly, a medium for telling stories. Originally these were conceived as short stories - early producers doubted the ability of audiences to concentrate for more than the length of a reel. Then, in 1912, an Italian 2-hour film was hugely successful, and Hollywood settled upon the novel-length narrative that remains the dominant cinematic convention of today.

J And it has all happened so quickly. Almost unbelievably, it is a mere 100 years since that train arrived and the audience screamed and fled, convinced by the dangerous reality of what they saw, and, perhaps, suddenly aware that the world could never be the same again - that, maybe, it could be better, brighter, more astonishing, more real than reality

Questions 1-5

Reading Passage 1 has ten paragraphs, A-J.

Which paragraph contains the following information?

Write the correct letter, A-J, in boxes 1-5 on your answer sheet.

- 1 the location of the first cinema
- 2 how cinema came to focus on stories
- 3 the speed with which cinema has changed
- 4 how cinema teaches us about other cultures
- 5 the attraction of actors in films

Homer's Literary Legacy

A. Until the last tick of history's homers-literary-legacy-ielts-reading-practice-testclock, cultural transmission meant oral transmission, and poetry, passed from mouth to ear, was the principal medium of moving information across space and from one generation to the next. Oral poetry was not simply a way of telling lovely or important stories, or of flexing the imagination. It was, argues the classicist Eric Havelock, a 'massive repository of useful knowledge, a sort of encyclopaedia of ethics, politics, history and technology which the effective citizen was required to learn as the core of his educational equipment'. The great

oral works transmitted a shared cultural heritage, held in common not on bookshelves, but in brains. In India, an entire class of priests was charged with memorising the vedas with perfect fidelity. In pre-islamic Arabia, people known as Rawis were often attached to poets as official memorizers. The Buddha's teachings were passed down in an unbroken chain of oral tradition for four centuries until they were committed to writing in Sri Lanka in the first century B.C.

B. The most famous of the Western tradition's oral works, and the first to have been systematically studied, were Homer's *Odyssey* and *Iliad*. These two poems - possibly the first to have been written down in the Greek alphabet - had long been held up as literary archetypes. However, even as they were celebrated as the models to which all literature should aspire, Homer's masterworks had also long been the source of scholarly unease. The earliest modern critics sensed that they were somehow qualitatively different from everything that came after - even a little strange. For one thing, both poems were oddly repetitive in the way they referred to characters. Odysseus was always 'clever Odysseus'. Dawn was always 'rosy-fingered'. Why would someone write that? Sometimes the epithets seemed completely off-key. Why call the murderer of Agamemnon 'blameless Aegisthos'? Why refer to 'swift-footed Achilles' even when he was sitting down? Or to 'laughing Aphrodite' even when she was in tears? In terms of both structure and theme, the *Odyssey* and *Iliad* were also oddly formulaic, to the point of predictability. The same narrative units - gathering armies, heroic shields, challenges between rivals - pop up again and again, only with different characters and different circumstances. In the context of such finely spun, deliberate masterpieces, these quirks seemed hard to explain.

C. At the heart of the unease about these earliest works of literature were two fundamental questions: first, how could Greek literature have been born out of nothing with two masterpieces? Surely a few less perfect stories must have come before, and yet these two were among the first on record. And second, who exactly was their author? Or was it the authors? There were no historical records of Homer, and no trustworthy biography of the man exists beyond a few self-referential hints embedded in the texts themselves.

D. Jean-Jacques Rousseau was one of the first modern critics to suggest that Homer might not have been an author in the contemporary sense of a single person who sat down and wrote a story and then published it for others to read. In his 1781 *Essay on the Origin of Languages*, the Swiss philosopher suggested that the *Odyssey* and *Iliad* might have been 'written only in men's memories. Somewhat later they were laboriously collected in writing' – though that was about as far as his enquiry into the matter went.

E. In 1795, the German philologist Friedrich August Wolf argued for the first time that not only were Homer's works not written down by Homer, but they weren't even by Homer. They were, rather, a loose collection of songs transmitted by generations of Greek bards, and only redacted in their present form at some later date. In 1920, an eighteen-year-old scholar named Milman Parry took up the question of Homeric authorship as his Master's thesis at the University of California, Berkeley. He suggested that the reason Homer's epics seemed unlike other literature was because they were unlike other literature. Parry had discovered what Wood and Wolf had missed: the evidence that the poems had been transmitted orally was right there in the text itself. All those stylistic quirks, including the formulaic and recurring plot elements and the bizarrely repetitive epithets – 'clever Odysseus' and 'grey-eyed Athena' – that had always perplexed readers were actually like thumbprints left by a potter: material evidence of how the poems had been crafted. They were mnemonic aids that helped the bards fit the metre and pattern of the line, and remember the essence of the poems.

F. The greatest author of antiquity was actually, Parry argued, just 'one of a long tradition of oral poets that...composed wholly without the aid of writing'. Parry realised that if you were setting out to create memorable poems, the *Odyssey* and the *Iliad* were exactly the kind of poems you'd create. It's said that clichés are the worst sin a writer can commit, but to an oral bard, they were essential. The very reason that clichés so easily seep into our speech and writing – their insidious memorability – is exactly why they played such an important role in oral storytelling. The principles that the oral bards discovered as they sharpened their stories through telling and retelling were the same mnemonic principles that psychologists rediscovered when they began conducting their first scientific experiments on memory around the turn of the twentieth century. Words that rhyme are much more memorable than

words that don't, and concrete nouns are easier to remember than abstract ones. Finding patterns and structure in information is how our brains extract meaning from the world, and putting words to music and rhyme is a way of adding extra levels of pattern and structure to language.

Questions

Questions 1-6

Reading passage has six paragraphs, A-F.

Which paragraph contains the following information?

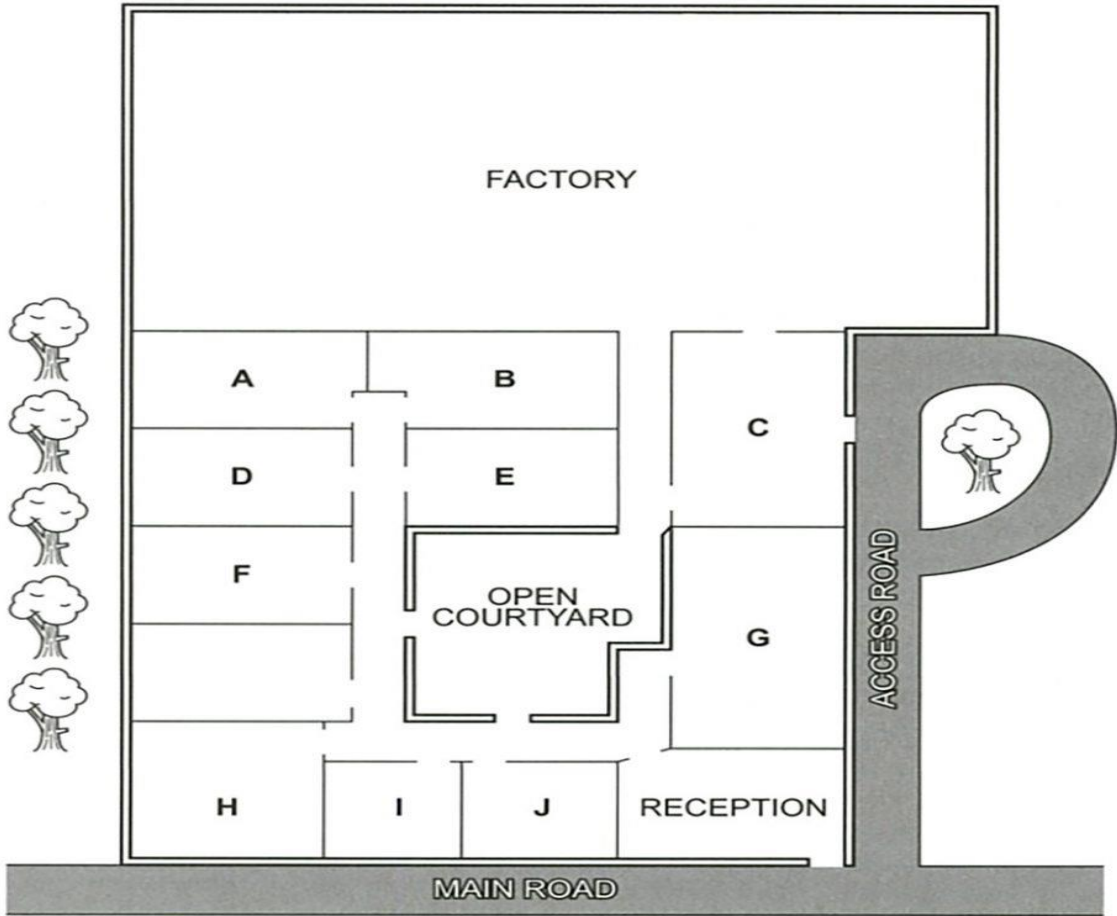
1. the claim that Odyssey and Iliad were not poems in their original form.
2. a theory involving the reinterpretation of the term 'author'
3. references to the fact that little is known about Homer's life
4. a comparison between the construction of Homer's poems and another art form
5. examples of the kinds of people employed to recall language
6. doubts regarding Homer's inappropriate descriptions

Questions 15-20

Label the map below.

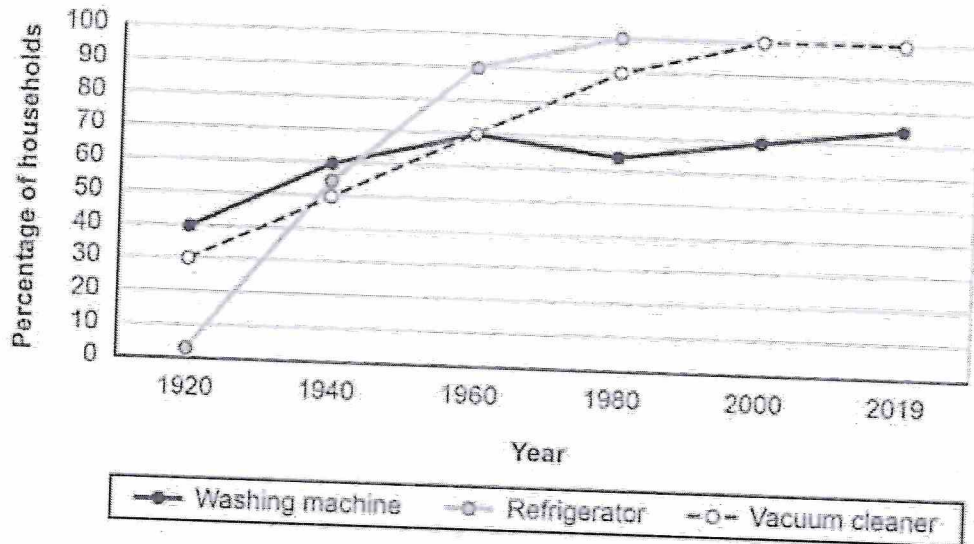
Write the correct letter, A-J, next to Questions 15-20.

Plan of Stevenson's site

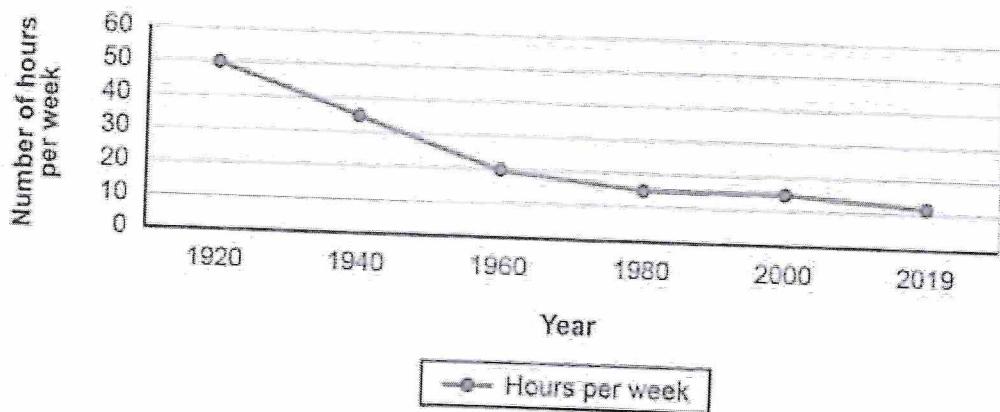


- 15 coffee room
- 16 warehouse
- 17 staff canteen
- 18 meeting room
- 19 human resources
- 20 boardroom

Percentage of households with electrical appliances (1920-2019)



Number of hours of housework* per week, per household (1920-2019)



*housework = washing clothes, preparing meals, cleaning

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Tense used in line graph:

Past tense

Active: verb form 2

Passive: was/were+v3 + by

Adjective + verb

Verb+ adverb (ly)

Introduction:

The assigned line graph illustrates the information about the percentage of households with electrical appliances along with the number of hours of housework per week per household from 1920 to 2019.

Overall:

it is crystal clear that the percentum of households with electrical appliances followed and increasing trend. Whereas, the need for doing housework followed a decreasing trend.

Sentence formations for data depictions:

__ of households used to have vaccum cleaners in 1920 which inclined significantly till 2000. However, it remained stable at 100 in 2019. In 1920, people had__ washing machines, by passing time it showed certain fluctuations and reached at above __ in the eventual year.

line graph

8/ March

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The assigned line graphs illustrate the information about the percentage of households with electrical appliances along with the number of hours of housework per week per household from 1920 to 2019.

Overall, it is crystal clear that the percentage of households with electrical appliances followed an increasing trend. whereas, the need for doing housework followed a ~~deat~~ decreasing trend.

To begin with, only 30 percent of households used to have vacuum cleaners in ¹⁹²⁰ which inclined significantly till 2000. However, it remained stable at 100 in 2019. In 1920, people had 40% washing machines, ~~but~~ by passing time it showed certain fluctuations and reached at above 70% in recent year.

Moving further, a negligible percentile of individuals preferred to have refrigerator, interestingly it rose sharply from in between two decades. Despite having a slight incline in 1960, it reached the peak point of 100% then remained static until 2019. Moreover, In 1920, the highest number ^{of work} people used to do housework, stood at 50 hours per week. However, it dropped at nadir point.