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Academic Reading Practice Test 42

Reading Passage 1

You should spend about 20 minutes on Questions 1-13 which are based on Reading Passage 1 below.

The Mozart Effect

A Music has been used for centuries to heal the body. In the *Ebers Papyrus* (one of the earliest medical documents, circa 1550 BC), it was recorded that physicians chanted to heal the sick (Castleman, 1994). In various cultures, we have observed singing as part of healing rituals. In the world of Western medicine, however, using music in medicine lost popularity until the introduction of the radio. Researchers then started to notice that listening to music could have significant physical effects. Therapists noticed music could help calm anxiety, and researchers saw that listening to music could cause a drop in blood pressure. In addition to these two areas, music has been used with cancer chemotherapy to reduce nausea, during surgery to reduce stress hormone production, during childbirth, and in stroke recovery (Castleman, 1994 and Westley, 1998). It has been shown to decrease pain as well as enhance the effectiveness of the immune system. In Japan, compilations of music are used as medication of sorts. For example, if you want to cure a headache or migraine, the album suggested is Mendelssohn's "Spring Song", Dvorak's "Humoresque", or part of George Gershwin's "An American in Paris" (Campbell, 1998). Music is also being used to assist in learning, in a phenomenon called the Mozart Effect.

B Frances H. Rauscher, PhD, first demonstrated the correlation between music and learning in an experiment in 1993. His experiment indicated that a 10-minute dose of Mozart could temporarily boost intelligence. Groups of students were given intelligence tests after listening to silence, relaxation tapes, or Mozart's "Sonata for Two Pianos in D Major" for a short time. He found that after silence, the average IQ score was 110, and after the relaxation tapes, the score rose a point. After listening to Mozart's music, however, the score jumped to 119 (Westley, 1998). Even students who did not like the music still had an increased score in the IQ test. Rauscher hypothesised that "listening to complex, non-repetitive music, like Mozart's, may stimulate neural pathways that are important in thinking" (Castleman, 1994).

C The same experiment was repeated on rats by Rauscher and Hong Hua Li from Stanford. Rats also demonstrated enhancement in their intelligence performance. These new studies indicate that rats that were exposed to Mozart's showed "increased gene expression of BDNF (a neural growth factor), CREB (a learning and memory compound), and Synapsin I (a synaptic growth protein)" in the brain's hippocampus, compared with rats in the control group, which heard only white noise (e.g. the whooshing sound of a radio tuned between stations).

D How exactly does the Mozart Effect work? Researchers are still trying to determine the actual mechanisms for the formation of these enhanced learning pathways. Neuroscientists suspect that music can actually help build and strengthen connections between neurons in the cerebral cortex in a process similar to what occurs in brain development despite its type. When a baby is born, certain connections have already been made – like connections for heartbeat and breathing. As new information is learned and motor skills develop, new neural connections are formed. Neurons that are not used will eventually die while those used repeatedly will form strong connections. Although a large number of these neural connections require experience, they must also occur within a certain time frame. For example, a child born with cataracts cannot develop connections within the visual cortex. If the cataracts are removed by surgery right away, the child's vision develops normally. However, after the age of 2, if the cataracts are removed, the child will remain blind because those pathways cannot establish themselves.

E Music seems to work in the same way. In October of 1997, researchers at the University of Konstanz in Germany found that music actually rewires neural circuits (Begley, 1996). Although some of these circuits are formed for physical skills needed to play an instrument, just listening to music strengthens connections used in higher-order thinking. Listening to music can then be thought of as "exercise" for the brain, improving concentration and enhancing intuition.

F If you're a little sceptical about the claims made by supporters of the Mozart Effect, you're not alone. Many people accredit the advanced learning of some children who take music lessons to other personality traits, such as motivation and persistence, which are required in all types of learning. There have also been claims of that influencing the results of some experiments.

G Furthermore, many people are critical of the role the media had in turning an isolated study into a trend for parents and music educators. After the Mozart Effect was published to the public, the sales of Mozart CDs stayed on the top of the hit list for three weeks. In an article by Michael Linton, he wrote that the research that began this phenomenon (the study by researchers at the University of California, Irvine) showed only a temporary boost in IQ, which was not significant enough to even last throughout the course of the experiment. Using music to influence intelligence was used in Confucian civilisation and Plato alluded to Pythagorean music when he described its ideal state in *The Republic*. In both of these examples, music did not cause any overwhelming changes, and the theory eventually died out. Linton also asks, "If Mozart's music were able to improve health, why was Mozart himself so frequently sick? If listening to Mozart's music increases intelligence and encourages spirituality, why aren't the world's smartest and most spiritual people Mozart specialists?" Linton raises an interesting point, if the Mozart Effect causes such significant changes, why isn't there more documented evidence?

H The "trendiness" of the Mozart Effect may have died out somewhat, but there are still strong supporters (and opponents) of the claims made in 1993. Since that initial experiment, there has not been a surge of supporting evidence. However, many parents, after playing classical music while pregnant or when their children are young, will swear by the Mozart Effect. A classmate of mine once told me that listening to classical music while studying will help with memorisation. If we approach this controversy from a scientific aspect, although there has been some evidence that music does increase brain activity, actual improvements in learning and memory have not been adequately demonstrated.

Questions 1-5

Reading Passage 1 has eight paragraphs A-H.

Which paragraph contains the following information?

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

1 A description of how music affects the brain development of infants
2 Public's first reaction to the discovery of the Mozart Effect
3 The description of Rauscher's original experiment
4 The description of using music for healing in other countries
5 Other qualities needed in all learning

Questions 6-8

Complete the summary below.

Choose **NO MORE THAN ONE WORD** from the passage for each answer.

Write your answers in boxes 6-8 on your answer sheet.

During the experiment conducted by Frances Rauscher, subjects were exposed to the music for a **6** __________ period of time before they were tested. And Rauscher believes the enhancement in their performance is related to the **7** __________ nature of Mozart's music. Later, a similar experiment was also repeated on **8** __________.

Questions 9-13

Do the following statements agree with the information given in Reading Passage 1?

In boxes 9-13 on your answer sheet write

TRUE	if the statement agrees with the information
FALSE	if the statement contradicts the information
NOT GIVEN	if there is no information on this

9 All kinds of music can enhance one's brain performance to somewhat extent.
10 There is no neural connection made when a baby is born.
11 There are very few who question the Mozart Effect.
12 Michael Linton conducted extensive research on Mozart's life.
13 There is not enough evidence in support of the Mozart Effect today.

Reading Passage 2

You should spend about 20 minutes on Questions 14-26 which are based on Reading Passage 2 below.

The Ant and the Mandarin

In 1476, the farmers of Berne in Switzerland decided there was only one way to rid their fields of the cutworms attacking their crops. They took the pests to court. The worms were tried, found guilty and excommunicated by the archbishop. In China, farmers had a more practical approach to pest control. Rather than relying on divine intervention, they put their faith in frogs, ducks and ants. Frogs and ducks were encouraged to snap up the pests in the paddies and the occasional plague of locusts. But the notion of biological control began with an ant. More specifically, it started with the predatory yellow citrus ant Oecophylla smaragdina, which has been polishing off pests in the orange groves of southern China for at least 1,700 years. The yellow citrus ant is a type of weaver ant, which binds leaves and twigs with silk to form a neat, tent-like nest. In the beginning, farmers made do with the odd ants' nests here and there. But it wasn't long before growing demand led to the development of a thriving trade in nests and a new type of agriculture – ant farming.

For an insect that bites, the yellow citrus ant is remarkably popular. Even by ant standards, Oecophylla smaragdina is a fearsome predator. It's big, runs fast and has a powerful nip – painful to humans but lethal to many of the insects that plague the orange groves of Guangdong and Guangxi in southern China. And for at least 17 centuries, Chinese orange growers have harnessed these six-legged killing machines to keep their fruit groves healthy and productive.

Citrus fruits evolved in the Far East and the Chinese discovered the delights of their flesh early on. As the ancestral home of oranges, lemons and pomelos, China also has the greatest diversity of citrus pests. And the trees that produce the sweetest fruits, the mandarins – or kan – attract a host of plant-eating insects, from black ants and sap-sucking mealy bugs to leaf-devouring caterpillars. With so many enemies, fruit growers clearly had to have some way of protecting their orchards.

The West did not discover the Chinese orange growers' secret weapon until the early 20th century. At the time, Florida was suffering an epidemic of citrus canker and in 1915 Walter Swingle, a plant physiologist working for the US Department of Agriculture, was sent to China in search of varieties of orange that were resistant to the disease. Swingle spent some time studying the citrus orchards around Guangzhou, and there he came across the story of the cultivated ant. These ants, he was told, were "grown" by the people of a small village nearby who sold them to the orange growers by the nestful.

The earliest report of citrus ants at work among the orange trees appeared in a book on tropical and subtropical botany written by Hsi Han in AD 304. "The people of Chiao-Chih sell in their markets ants in bags of rush matting. The nests are like silk. The bags are all attached to twigs and leaves which, with the ants inside the nests, are for sale. The ants are reddish-yellow in colour, bigger than ordinary ants. In the south, if the kan trees do not have this kind of ant, the fruits will all be damaged by many harmful insects, and not a single fruit will be perfect."

Initially, farmers relied on nests which they collected from the wild or bought in the market where trade in nests was brisk. "It is said that in the south orange trees which are free of ants will have wormy fruits. Therefore, people race to buy nests for their orange trees," wrote Liu Hsun in *Strange Things Noted in the South* in about 890.

The business quickly became more sophisticated. From the 10th century, country people began to trap ants in artificial nests baited with fat. "Fruit-growing families buy these ants from vendors who make a business of collecting and selling such creatures," wrote Chuang Chi-Yu in 1130. "They trap them by filling hogs' or sheep's bladders with fat and placing them with the cavities open next to the ants' nests. They wait until the ants have migrated into the bladders and take them away. This is known as 'rearing orange ants'." Farmers attached the bladders to their trees, and in time the ants spread to other trees and built new nests.

By the 17th century, growers were building bamboo walkways between their trees to speed the colonisation of their orchards. The ants ran along these narrow bridges from one tree to another and established nests "by the hundreds of thousands".

Did it work? The orange growers clearly thought so. One authority, Chhii Ta-Chun, writing in 1700, stressed how important it was to keep the fruit trees free of insect pests, especially caterpillars. "It is essential to eliminate them so that the trees are not injured. But hand labour is not nearly as efficient as ant power..."

Swingle was just as impressed. Yet despite his reports, many Western biologists were sceptical. In the West, the idea of using one insect to destroy another was new and highly controversial. The first breakthrough had come in 1888, when the infant orange industry in California had been saved from extinction by the Australian vedalia beetle. This beetle was the only thing that had made any inroads into the explosion of cottony cushion scale that was threatening to destroy the state's citrus crops. But, as Swingle now knew, California's "first" was nothing of the sort. The Chinese had been expert in biocontrol for many centuries.

The long tradition of ants in the Chinese orchards only began to waver in the 1950s and 1960s with the introduction of powerful organic insecticides. Although most fruit growers switched to chemicals, a few hung onto their ants. Those who abandoned ants in favour of chemicals quickly became disillusioned. As costs soared and pests began to develop resistance to the chemicals, growers began to revive the old ant patrols in the late 1960s. They had good reason to have faith in their insect workforce.

Research in the early 1960s showed that as long as there were enough ants in the trees, they did an excellent job of dispatching some pests – mainly the larger insects – and had modest success against others. Trees with yellow ants produced almost 20 per cent more healthy leaves than those without. More recent trials have shown that these trees yield just as big a crop as those protected by expensive chemical sprays.

One apparent drawback of using ants – and one of the main reasons for the early scepticism by Western scientists – was that citrus ants do nothing to control mealy bugs, waxy-coated scale insects which can do considerable damage to fruit trees. In fact, the ants protect mealy bugs in exchange for the sweet honeydew they secrete. The orange growers always denied this was a problem but Western scientists thought they knew better.

Research in the 1980s suggests that the growers were right all along. Where mealy bugs proliferate under the ants' protection, they are usually heavily parasitised and this limits the harm they can do.

Orange growers who rely on carnivorous ants rather than poisonous chemicals maintain a better balance of species in their orchards. While the ants deal with the bigger insect pests, other predatory species keep down the numbers of smaller pests such as scale insects and aphids. In the long run, ants do a lot less damage than chemicals – and they're certainly more effective than excommunication.

Questions 14-18

Look at the following events (Questions 14-18) and the list of dates below.

Match each event with the correct time A-G.

Write the correct letter A-G in boxes 14-18 on your answer sheet.

14 The first description of citrus ants is traded in the marketplace.

15 Swingle came to Asia for research.

16 The first record of one insect is used to tackle other insects in the western world.

17 Chinese fruit growers started to use pesticides in place of citrus ants.

18 Some Chinese farmers returned to the traditional bio-method.

List of Dates

A	1888
B	AD 890
C	AD 304
D	1950s
E	1960s
F	1915
G	1130

Questions 19-26

Do the following statements agree with the information given in Reading Passage 2?

In boxes 19-26 on your answer sheet write

TRUE	if the statement agrees with the information
FALSE	if the statement contradicts the information
NOT GIVEN	if there is no information on this

19 China has more citrus pests than any other country in the world.

20 Swingle came to China to search for an insect to bring back to the US.

21 Many people were very impressed by Swingle's discovery.

22 Chinese farmers found that pesticides became increasingly expensive.

23 Some Chinese farmers abandoned the use of pesticide.

24 Trees with ants had more leaves fall than those without.

25 Fields using ants yield as large a crop as fields using chemical pesticides.

26 Citrus ants often cause considerable damage to the bio-environment of the orchards.

Reading Passage 3

You should spend about 20 minutes on Questions 27-40 which are based on Reading Passage 3 on the following page.

Questions 27-31

Reading Passage 3 has five sections A-E.

Choose the correct heading for each section from the list of headings below.

Write the correct number i-viii in boxes 27-31 on your answer sheet.

List of Headings

i Communication in music with animals
ii New discoveries on animal music
iii Music and language contrasted
iv Current research on music
v Music is beneficial for infants.
vi Music transcends cultures.
vii Look back at some of the historical theories
viii Are we genetically designed for music?

27 Section A
28 Section B
29 Section C
30 Section D
31 Section E

Music: Language We All Speak

Section A

Music is one of the human species' relatively few universal abilities. Without formal training, any individual, from Stone Age tribesman to suburban teenager, has the ability to recognise music and, in some fashion, to make it. Why this should be so is a mystery. After all, music isn't necessary for getting through the day, and if it aids in reproduction, it does so only in highly indirect ways. Language, by contrast, is also everywhere – but for reasons that are more obvious. With language, you and the members of your tribe can organise a migration across Africa, build reed boats and cross the seas, and communicate at night even when you can't see each other. Modern culture, in all its technological extravagance, springs directly from the human talent for manipulating symbols and syntax.

Scientists have always been intrigued by the connection between music and language. Yet over the years, words and melody have acquired a vastly different status in the lab and the seminar room. While language has long been considered essential to unlocking the mechanisms of human intelligence, music is generally treated as an evolutionary frippery – mere "auditory cheesecake", as the Harvard cognitive scientist Steven Pinker puts it.

Section B

But thanks to a decade-long wave of neuroscience research, that tune is changing. A flurry of recent publications suggests that language and music may equally be able to tell us who we are and where we're from – not just emotionally, but biologically. In July, the journal *Nature Neuroscience* devoted a special issue to the topic. And in an article in the 6 August issue of the *Journal of Neuroscience*, David Schwartz, Catherine Howe, and Dale Purves of Duke University argued that the sounds of music and the sounds of language are intricately connected.

To grasp the originality of this idea, it's necessary to realise two things about how music has traditionally been understood. First, musicologists have long emphasised that while each culture stamps a special identity onto its music, music itself has some universal qualities. For example, in virtually all cultures, sound is divided into some or all of the 12 intervals that make up the chromatic scale – that is, the scale represented by the keys on a piano. For centuries, observers have attributed this preference for certain combinations of tones to the mathematical properties of sound itself.

Some 2,500 years ago, Pythagoras was the first to note a direct relationship between the harmoniousness of a tone combination and the physical dimensions of the object that produced it. For example, a plucked string will always play an octave lower than a similar string half its size, and a fifth lower than a similar string two thirds its length. This link between simple ratios and harmony has influenced music theory ever since.

Section C

This music-is-math idea is often accompanied by the notion that music, formally speaking at least, exists apart from the world in which it was created. Writing recently in *The New York Review of Books*, pianist and critic Charles Rosen discussed the long-standing notion that while painting and sculpture reproduce at least some aspects of the natural world, and writing describes thoughts and feelings we are all familiar with, music is entirely abstracted from the world in which we live. Neither idea is right, according to David Schwartz and his colleagues. Human musical preferences are fundamentally shaped not by elegant algorithms or ratios but by the messy sounds of real life, and of speech in particular – which in turn is shaped by our evolutionary heritage. "The explanation of music, like the explanation of any product of the mind, must be rooted in biology, not in numbers per se," says Schwartz.

Schwartz, Howe, and Purves analysed a vast selection of speech sounds from a variety of languages to reveal the underlying patterns common to all utterances. In order to focus only on the raw sounds, they discarded all theories about speech and meaning, and sliced sentences into random bites. Using a database of over 100,000 brief segments of speech, they noted which frequency had the greatest emphasis in each sound. The resulting set of frequencies, they discovered, corresponded closely to the chromatic scale. In short, the building blocks of music are to be found in speech.

Far from being abstract, music presents a strange analogue to the patterns created by the sounds of speech. "Music, like visual arts, is rooted in our experience of the natural world," says Schwartz. "It emulates our sound environment in the way that visual arts emulate the visual environment." In music we hear the echo of our basic sound-making instrument – the vocal tract. The explanation for human music is simpler still than Pythagoras's mathematical equations: We like the sounds that are familiar to us – specifically, we like the sounds that remind us of us.

This brings up some chicken-or-egg evolutionary questions. It may be that music imitates speech directly, the researchers say, in which case it would seem that language evolved first. It's also conceivable that music came first and language is in effect an imitation of song – that in everyday speech we hit the musical notes we especially like. Alternately, it may be that music imitates the general products of the human sound-making system, which just happens to be mostly speech. "We can't know this," says Schwartz. "What we do know is that they both come from the same system, and it is this that shapes our preferences."

Section D

Schwartz's study also casts light on the long-running question of whether animals understand or appreciate music. Despite the apparent abundance of "music" in the natural world – birdsong, whalesong, wolf howls, synchronised chimpanzee hooting – previous studies have found that many laboratory animals don't show a great affinity for the human variety of music making.

Marc Hauser and Josh McDermott of Harvard argued in the July issue of *Nature Neuroscience* that animals don't create or perceive music the way we do. The fact that laboratory monkeys can show recognition of human tunes is evidence, they say, of shared general features of the auditory system, not any specific chimpanzee musical ability. As for birds, those most musical beasts, they generally recognise their own tunes – a narrow repertoire – but don't generate novel melodies like we do. There are no avian Mozarts.

But what's been played to animals, Schwartz notes, is human music. If animals evolve preferences for sound as we do – based upon the soundscape in which they live – then their "music" would be fundamentally different from ours. In the same way our scales derive from human utterances, a cat's idea of a good tune would derive from yowls and meows. To demonstrate that animals don't appreciate sound the way we do, we'd need evidence that they don't respond to "music" constructed from their own sound environment.

Section E

No matter how the connection between language and music is parsed, what is apparent is that our sense of music, even our love for it, is as deeply rooted in our biology and in our brains as language is. This is most obvious with babies, says Sandra Trehub at the University of Toronto, who also published a paper in the *Nature Neuroscience* special issue.

For babies, music and speech are on a continuum. Mothers use musical speech to "regulate infants' emotional states", Trehub says. Regardless of what language they speak, the voice all mothers use with babies is the same: "something between speech and song". This kind of communication "puts the baby in a trance-like state, which may proceed to sleep or extended periods of rapture". So if the babies of the world could understand the latest research on language and music, they probably wouldn't be very surprised. The upshot, says Trehub, is that music may be even more of a necessity than we realise.

Questions 32-38

Look at the following people (Questions 32-38) and the list of statements below.

Match each person with the correct statement.

Write the correct letter A-G in boxes 32-38 on your answer sheet.

32 Steven Pinker
33 Musicologists
34 Greek philosopher Pythagoras
35 Schwartz, Howe, and Purves
36 Marc Hauser and Josh McDermott
37 Charles Rosen
38 Sandra Trehub

List of Statements

A Music exists outside of the world it is created in.
B Music has a universal character despite cultural influences on it.
C Music is a necessity for humans.
D Music preference is related to the surrounding influences.
E He discovered the mathematical basis of music.
F Music doesn't enjoy the same status of research interest as language.
G Humans and monkeys have similar traits in perceiving sound.

Questions 39-40

Choose the correct letter A, B, C or D.

Write your answers in boxes 39-40 on your answer sheet.

39 Why was the study of animal music inconclusive?

A Animals don't have the same auditory system as humans.

B Tests on animal music are limited.

C Animals can't make up new tunes.

D There aren't enough tests on a wide range of animals.

40 What is the main theme of this passage?

A Language and learning

B The evolution of music

C The role of music in human society

D Music for animals