

READING PASSAGE 2

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

Mind Music

Scientists investigate ‘earworms’, the music we can’t get out of our heads

- A** Ever had a song stuck in your head, playing on an endless loop? Scientists call them ‘involuntary musical images’, or ‘earworms’, and a wave of new research is shining light on why they occur and what can be learned from them. Some neuroscientists and cognitive psychologists are studying earworms to explore the mysteries of memory and the part of the brain that is beyond our conscious control. ‘The idea that we have full control over our thought processes is an illusion,’ says psychologist Lauren Stewart, who founded the master’s program in music, mind and brain at Goldsmiths, University of London, UK, where recent research has taken place. Researchers haven’t been able to watch what happens in the brain when earworms occur, because they happen unpredictably. Much of what is known about them comes from surveys, questionnaires, diaries and lab experiments.
- B** A Goldsmiths study published in the journal Memory and Cognition this year showed that the singing we hear in our heads tends to be true to actual recordings. Researchers had 17 volunteers tap to the beat of any earworm they heard during a four-day period while a device attached to their wrist recorded their movements. The tapping tempos were within 10% of the tempos of the original recordings. Another Goldsmiths study, published this year in Consciousness and Cognition, found that people who report hearing earworms often, and find them most intrusive, have slightly different brain structures, with more gray matter in areas associated with processing emotions.
- C** Studies also show that the music in our heads often starts playing during times of ‘low cognitive load’, such as while showering, getting dressed, walking, or doing chores. Dr Stewart likens earworms to ‘sonic screen savers’ that keep the mind entertained while it is otherwise unoccupied. She and her colleagues tested that theory by having volunteers listen to songs and giving them various tasks afterwards. The volunteers who sat idly for the next five minutes were the most likely to report hearing the music in their heads. Dr Stewart observed that the more challenging the activity, the less likely the volunteers were to hear the music. Diary studies also show songs tend to match people’s moods and therefore they are not random. If you are energized and upbeat, an earworm that occurs is likely to be uptempo too.

- D Songs the brain fixates on are usually those it has been exposed to recently, surveys show, which is why tunes getting heavy radio play frequently top the earworm charts. Even tunes you may have heard but didn't pay attention to can worm their way into your subconscious, says Ira Hyman, a psychologist at Western Washington University in Bellingham, USA. In an unpublished study there, participants who listened to music while doing other tasks were more likely to report that the songs returned as earworms later on, compared with participants who simply listened.
- E Some earworms are just fragments of a song that repeat like a broken record. So, when the mind hits a part of a song it can't remember, it loops back rather than moving on. That could make an earworm even more entrenched, Dr Hyman says. According to a theory known as the Zeigarnik effect, named for a Soviet psychologist, Bluma Zeigarnik, unfinished thoughts and activities weigh on the mind more heavily than those that are completed, although experiments exposing students to interrupted songs have yielded mixed results.
- F Researchers say they can't pinpoint a spot in the brain where earworms live. Imaging studies by Andrea Halpern at Bucknell University, in Lewisburg, USA, have shown that deliberately imagining music and actually listening to music activate many of the same neurological networks. Dr Halpern's earlier studies showed that when subjects listened to the first few notes of familiar music, areas in the right frontal and superior temporal portions of the brain became activated, along with the supplementary motor area at the top, which is typically involved in remembering sequences. When the same subjects listened to unfamiliar music and were asked to recall it, there was activity in the left frontal portions of the brain instead.
- G One factor that makes some songs stick might be repetition. 'Repetition leads to familiarity which leads to anticipation, which is satisfied by hearing the song,' says John Seabrook, author of *The Song Machine: Inside the Hit Factory*, about how producers pump pop songs full of aural 'hooks', the punchy melodic phrases designed to target the brain and leave it wanting more. The researchers are comparing the melodic structure of 100 often mentioned songs with 100 similarly popular songs that weren't cited as earworms, to assess the difference. Songs with earworm potential appear to share certain features: a repeating pattern of ups and downs in pitch, and irregular musical intervals.
- H The researchers plan next to test their results in reverse, and play ringtones from songs of both the earworm and non-earworm variety for volunteers several times a day to see which ones get stuck. Drs Stewart and Halpern are now working together to recruit survey participants for a study looking at whether people at different stages of life experience earworms differently. 'You can argue that older people might get them more often because they know more songs,' Dr Halpern says. 'But the few responses we have so far indicate that they have earworms less often. It could be that they don't play music as often as younger people do.'

Questions 14–17

Reading Passage 2 has eight paragraphs, **A–H**

Which paragraph contains the following information?

Write the correct letter, **A–H**, in boxes 14–17 on your answer sheet.

14 a description of the characteristics common to songs with earworms

15 a justification for research into earworms

16 a description of the brain's reaction to known and unknown songs

17 details of proposed research into the frequency with which earworms occur in different age groups.

Questions 18–21

Complete the summary below.

Choose **ONE WORD ONLY** from the passage for each answer.

Write your answers in boxes 18–21 on your answer sheet.

Goldsmiths study

Researchers from Goldsmiths concluded that the music we imagine in our minds is quite similar to recordings. They proved this by asking volunteers to record the rhythm of music using a monitor on their **18** _____. Further research has demonstrated that those who hear earworms more frequently have brains that may deal with **19** _____ differently from other people. Dr Stewart also believes that the brain is **20** _____ by earworms when it is not focused on a task. In fact, a reduction in the occurrence of earworms was found to be directly related to how **21** _____ the task was. Interestingly, volunteers' diaries revealed that the songs they heard inside their head reflected their moods, so the choice of music is not accidental.

Questions 22–26

Look at the following statements and the list of researchers below.

*Match each statement with the correct person, **A**, **B**, **C** or **D**.*

*Write the correct letter **A**, **B**, **C** or **D**, in boxes 22-26 on your answer sheet.*

NB You may use any letter more than once.

22 Some musicians create music that is intentionally memorable.

23 People are unable to completely regulate how they think

24 We can remember songs without knowing that we have heard them.

25 Thinking about music has a similar effect on the brain to hearing music.

26 Earworms are more persistent when only a short section of the song is constantly replayed.

List of Researchers

- A** Lauren Stewart
- B** Ira Hyman
- C** Andrea Halpern
- D** John Seabrook

一、段落配对 (14–17)

题号	答案	题干要点翻译	精确定位句 (第 X 段)	解释 (含同义改写)
14	G	“描述耳虫歌曲共有的特征”	“Songs with earworm potential appear to share certain features: a repeating pattern of ups and downs in pitch, and irregular musical intervals.” (第 G 段)	题干翻译抓点: characteristics common to = 共有特征。同义改写: share certain features ⇔ common characteristics; 具体特征=音高起伏的重复模式 + 不规则音程。完全正面回答“共同特征”。
15	A	“对研究耳虫现象的正当性/理由”	“Some neuroscientists and cognitive psychologists are studying earworms to explore the mysteries of memory and the part of the brain that is beyond our conscious control.” (第 A 段)	题干翻译抓点: a justification for research = 为什么要研究。同义改写: to explore... (为了探索...) = 研究的目的/正当性; 即借耳虫研究记忆与非意识控制的脑区。
16	F	“已知与未知歌曲时大脑反应的描述”	“Deliberately imagining music and actually listening activate many of the same neurological networks... For familiar music: right frontal & superior temporal + supplementary motor area; for unfamiliar music: left frontal...” (第 F 段)	题干翻译抓点: brain's reaction to known/unknown songs. 同义改写: familiar ⇔ known; unfamiliar ⇔ unknown; 不同条件下激活的脑区不同, 构成“反应差异”的直接证据。
17	H	“拟进行的研究细节: 不同年龄组的耳虫出现频率/差异”	“Drs Stewart and Halpern... recruit... for a study looking at whether people at different stages of life experience earworms differently. ” (第 H 段)	题干翻译抓点: proposed research = 拟开展; frequency with which... in different age groups = 不同年龄段的出现频率/差异。同义改写: different stages of life ⇔ different age groups; experience differently ⇔ 发生频率/比例有差异。本段还提到将反向测试铃声黏性, 但年龄变量对应此句。

二、摘要填空 (18–21)

题号	答案 (ONE WORD ONLY)	题干要点翻译	精确定位句 (第 X 段)	解释 (含同义改写与语法提示)
18	wrist	“用监测器记录节奏, 戴在他们的**____**上”	“...a device attached to their wrist recorded their movements.” (第 B 段)	同义改写: monitor on their ____ ⇔ device attached to their wrist . 词性与数形吻合。
19	emotions	“更常有耳虫者的大脑在处理**____**方面不同”	“...more gray matter in areas associated with processing emotions .” (第 B 段)	同义改写: deal with ____ differently ⇔ processing emotions (加工情绪)。名词复数 emotions 。
20	entertained	“当不专注任务时, 耳虫让大脑被**____**”	“earworms... keep the mind entertained while it is otherwise unoccupied.” (第 C 段)	语法: 被动结构 is entertained 与原句 keep the mind entertained 对应; 语义=被“娱乐/打发”。
21	challenging	“耳虫发生的减少与任务**多么____**呈正相关”	“ the more challenging the activity, the less likely... to hear the music.” (第 C 段)	同义改写: “reduction... directly related to how challenging the task was” ⇔ 难度越大, 耳虫越少; 用形容词 “challenging” 填空最贴合原句结构。

| 小贴士: 20 要用形容词过去分词作补语 (entertained); 21 需要形容词而非名词 “difficulty”。

三、研究者配对 (22–26)

题号	答案	题干要点翻译	精确定位句 (第 X 段)	解释 (含同义改写)
22	D (John Seabrook)	“有些音乐人有意创作特别上头/易记的音乐”	“...how producers pump pop songs full of aural 'hooks', ... designed to target the brain and leave it wanting more .” (第 G 段)	同义改写: intentionally memorable ↔ 塞满“hooks”以精准打击大脑、增强记忆与期待。Seabrook 作为作者总结制作人做法。
23	A (Lauren Stewart)	“人们无法完全调控自己的思维”	“ The idea that we have full control over our thought processes is an illusion , says psychologist Lauren Stewart...” (第 A 段)	直陈“完全控制是幻觉”= 不能彻底调节思维。与题干一一对应。
24	B (Ira Hyman)	“我们在不自知的情况下也能记住/内化歌曲”	“Even tunes you may have heard but didn't pay attention to can worm their way into your subconscious.” (第 D 段)	同义改写: without knowing we've heard them ↔ 没注意也进入潜意识; 随后还提未发表研究佐证。
25	C (Andrea Halpern)	“想音乐与听音乐对大脑效应相似”	“ Imagining music and actually listening ... activate many of the same neurological networks.” (第 F 段)	想象=imaging; 相同网络被激活=相似效应。
26	B (Ira Hyman)	“当只反复短片段时, 耳虫更顽固/持久”	“Some earworms are just fragments ... the mind... loops back ... That could make an earworm even more entrenched , Dr Hyman says.” (第 E 段)	同义改写: short section constantly replayed ↔ fragment + loops back; more persistent ↔ more entrenched , 来源明确为 Hyman。