

RIPPLE ENGLISH

ACTIVE LEARNING PROGRAM

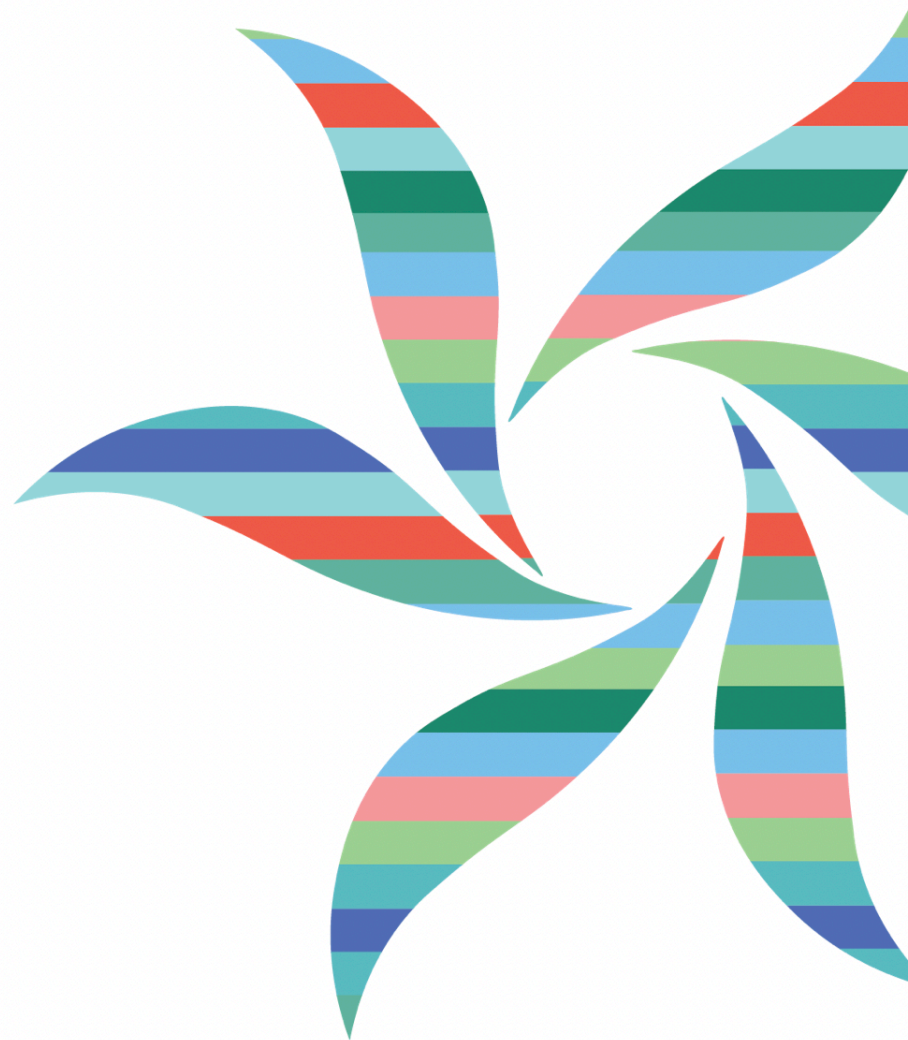
Workbook for:
“Why We Sleep and Why We Have To”

問題は解きっぱなしにしないで！

英語資格試験の学習は、**解いた後の復習をしなければほとんど効果はありません。**

答え合わせをしておしまいせずに、テキストの音読練習やリスニング、多読学習などのインプット学習を何度も反復して記憶に定着させましょう。ホームページからダウンロードできる音読練習用のテキストをぜひご活用ください。

また、数日置いてから再度解き直すのも効果的です。答えを記憶してしまっているかもしれませんが、回答の根拠をなぞりながら繰り返し解くことで有効な復習になります！



Why We Sleep and Why We Have To

1. Sleep is essential in many aspects of life. Healthy sleep recharges our bodies and minds, enhances learning and memory, and stabilizes our emotions. We spend about a third of our lives sleeping, but few people understand the functions of sleep. What exactly happens during our **slumber**? Sleep is composed of two types of sleep. One is rapid eye movement sleep or REM sleep. It is during the REM sleep that we dream. This type of sleep provides us with a form of emotional recovery, and boosts our creativity by stitching information in our brain together. The other is non-rapid eye movement sleep or non-REM sleep. Non-REM sleep improves our physical health by repairing our immune function and cardiovascular system. It also helps us fixate memory. REM and non-REM sleep occur in turn within a standard 90-minute cycle, and the ratio within those cycles changes throughout the night. Initially, non-REM sleep accounts for the majority of sleep per 90-minute cycle, but as we move across the night, most of those 90-minute cycles consist of a lot more REM sleep or dream sleep.
2. Sleep loss is critical for both physical and mental health. Just one hour of sleep deprivation significantly affects mortality rates. This finding comes from a global experience in which 1.5 billion people are forced to reduce their sleep by one hour, for a single night every year. We call it “daylight savings time.” In the Northern hemisphere, the switch to daylight savings time in March makes people to lose an hour of sleep. Surprisingly, we see a sudden 24-percent increase in heart attacks specifically that following day. And it works both ways. The complete opposite happens in the autumn; we see a significant reduction in mortalities when daylight savings time ends and people gain one hour of sleep opportunity time. **A similar rise-and-fall relationship can be seen with the number of traffic accidents, and even suicide rates.**

- (1) The word “slumber” in the passage is closest in meaning to
 - A. night
 - B. sleep
 - C. brain
 - D. physiology
- (2) According to paragraph 1, which of the following is NOT true?
 - A. Non-REM sleep helps you fight off diseases.
 - B. Under sleep deprivation, you will remain emotionally wounded
 - C. Sufficient Non-REM sleep may help you get good scores at exams
 - D. Dreams in REM sleep stitch information together to fixate memory
- (3) Which of the following text best expresses the essential information in the highlighted sentence?

A similar rise-and-fall relationship can be seen with the number of traffic accidents, and even suicide rates.

 - A. Rise and fall in the rate of heart attacks has a causal relationship with the rate of car crashes and suicide.
 - B. More people have car accidents and commit suicide at the day when daylight savings time starts and vice versa.
 - C. Just one hour of sleep is a night is enough to help people avert misfortune.
 - D. A lag caused by the start and end of daylight savings time makes people emotionally irrational.

3. Everyone knows sleep helps us consolidate what we have learned as our long-term memory. But did you know the same is true for all motor skills? Riding a bike, playing a musical instrument, an athletic sport, whatever that is, sleep helps the brain automate the movement routines so that you can do it **subconsciously** and effortlessly. We say “practice makes perfect,” but it is actually practice plus sleep that brings you to perfection.
4. Sleep is also essential for creativity. During REM sleep, our brain organizes and combines different information and knowledge in our memory. We often have strange dreams because our brain is building connections between distantly related information, trying every possible combination of ideas and experiences. Thanks to REM sleep we wake up with solutions to problems that seemed difficult to solve before going to bed.
5. Though humans all follow a constant 24-hour circadian rhythm, their peak and trough points differ from one another. Some people are most awake during the day and sleepest early at night while others go to bed late and wake up before the following noon. Why are our sleeping habits so different? One’s sleeping pattern, also known as chronotype, is mostly determined by genetics. This means that one can rarely choose one’s own sleep pattern. If one or both of your parents is a morning type, you most likely have the same chronotype. How do we humans end up having variety of chronotypes? The answer lies in the hunter-gatherer era. In order to increase their survival rate, humans evolved so that each one has a different rhythm of their lives within the same community. A community composed of people with different chronotypes is unlikely to face the most vulnerable situation, where everyone in the community falls asleep.
6. Besides genetics, it is also known that adolescent teenagers have a different circadian rhythm from their parents. Their peak wakefulness usually occurs around the time their parents get sleepy. Asking your teenage son or daughter to go to bed and fall asleep at 10 p.m. is equivalent to asking you, their parent, to go to sleep at seven or eight p.m. Unfortunately, modern society requires every member of the community to live in the same rhythm regardless of one’s chronotype or age. This can be a big burden for evening types and teenagers.
- (4) The word “subconsciously” in the passage is closest in meaning to
- A. without thinking explicitly
 - B. inattentively
 - C. with the highest focus
 - D. diligently
- (5) According to paragraph 4, we have bizarre dream because
- A. the logical part of the brain is inactivated
 - B. our brain is trying to find inspired solutions by entertaining us
 - C. our brain is connecting unusual and irrelevant combination of memory
 - D. we lose our rationality during sleep
- (6) According to paragraph 5, which of the following is true?
- A. We should wake up early in the morning for our better health and productivity.
 - B. Your sleeping habit varies depending on your lifestyle.
 - C. Our chronotype is mostly hardwired into our body.
 - D. Our hunter-gatherer ancestors didn’t have to stay up late as we do today.
- (7) According to paragraph 6, which of the following is NOT true?
- A. It is a big burden for teenagers to stay up late due to a lot of homework.
 - B. Evening types are often put at a disadvantage.
 - C. Asking all the people in our society to wake up early is not reasonable.
 - D. Usually parents find it less hard to wake up early than their children.

7. We can all have trouble sleeping. But what if there are things you can do to have a good night of sleep? Here are some tips to help you develop better sleep habits. The first and most important thing in establishing good sleep habits is regularity: going to bed and getting up at the same time, whether on weekends or weekdays. Regularity is the most important thing to improve both the quality and the quantity of sleep. Having a routine before bedtime also helps you fall asleep quicker. You should find a bedtime routine that works for you, such as avoiding electronic devices and doing something relaxing before bedtime. Studies show that meditation is also effective in speeding up the onset of sleep.
8. The final tip is about caffeine. There is a chemical released in your brain, named adenosine. The longer you stay awake, the more adenosine will accumulate. And the more adenosine accumulated, the sleepier you will become. Then how does caffeine make us awake? Caffeine and adenosine **compete** for the same receptors. When caffeine blocks the receptors, adenosine can no longer work to make you sleepy. The problem with caffeine is that it takes time to be extracted from your body. It takes five to seven hours to remove caffeine in your system by half. It means that if you have a cup of coffee at 7:30 p.m., 50% of the caffeine still remains at midnight, and half a shot is still very powerful. It is better to avoid caffeine in the afternoon.

- (8) The word “compete” in the passage is closest in meaning to
- A. take part in
 - B. give way to
 - C. fight
 - D. match
- (9) According to paragraph 8, caffeine makes us awake by
- A. removing adenosine
 - B. having your system work hard for extraction
 - C. persisting in your body for five to seven hours
 - D. occupying the receptors for drowsiness-inducing chemicals.
- (10) Within the whole passage, all of the following were mentioned, EXCEPT
- A. We cannot choose to be morning types or evening types.
 - B. REM sleep and Non-REM sleep switch at every 90 minutes.
 - C. Keeping consistent sleeping habit will help you sleep better.
 - D. Just one hour of sleep loss significantly affect our well-being.

Answers

- (1) B
(2) D
(3) B
(4) A
(5) C
(6) C
(7) A
(8) C
(9) D
(10) B

(1) slumberと最も意味が近いのは

- A. night（夜）
B. sleep（睡眠）
C. brain（脳）
D. physiology（生理機能）

duringの後ろに付いて違和感がないのはnightとsleepのみ。slumberは「まどろみ」「眠り」という意味なのでBが正解。

(2) 1 段落目の内容に合致しないのは

- A. Non-REM sleep helps you fight off diseases.
B. Under sleep deprivation, you will remain emotionally wounded
C. Sufficient Non-REM sleep may help you get good scores at exams
D. Dreams in REM sleep stitch information together to fixate memory

A：ノンレム睡眠が免疫（immunity）を高めるとあるため正しい。B：レム睡眠中に感情面での回復が行われるとあり、レム睡眠の不足は感情的な傷が癒やされないまま残すことになるので正しい。C：ノンレム睡眠中に記憶の定着が行われるので、テストでの高得点にも貢献すると思われる。

D：レム睡眠中の夢が情報をつなぎ合わせるというところまでは正しいが、それは問題の解決策を見つけ出すためであると記述されているので、記憶を定着させるためではないため誤り。

(3) Which of the following text best expresses the essential information in the highlighted sentence?

- A similar rise-and-fall relationship can be seen with the number of traffic accidents, and even suicide rates.
A. Rise and fall in the rate of heart attacks has a causal relationship with the rate of car crashes and suicide.
B. More people have car accidents and commit suicide at the day when daylight savings time starts and vice versa.
C. Just one hour of sleep is a night is enough to help people avert misfortune.
D. A lag caused by the start and end of daylight savings time makes people emotionally irrational.
サマータイムが始まる日は、日が一時間早くなることで人々はその日だけ睡眠時間が1時間短くなるが、その日だけ心臓発作の率が増え、逆にサマータイムが終わるタイミングで睡眠時間がその日だけ1時間伸びると率が下がるというデータを踏まえて、同じ傾向が交通事故の発生件数や自殺率にも見られるという内容に合致するBが正解。

(4) “subconsciously” と最も意味が近いのは

- A. without thinking explicitly（顕在意識で考えることなしに）**
B. inattentively（注意力散漫に）
C. with the highest focus（最高潮の集中力で）
D. diligently（勤勉に）

subconsciously（＝潜在意識下で）に最も近いAが正解。

(5) 4 段落によると、我々が奇妙な夢を見る理由は

- A. the logical part of the brain is inactivated
B. our brain is trying to find inspired solutions by entertaining us
C. our brain is connecting unusual and irrelevant combination of memory
D. we lose our rationality during sleep

“building connections between distantly related information”に合致するCが正解

(6) 5 段落の内容について正しいのは

- A. We should wake up early in the morning for our better health and productivity.
B. Your sleeping habit varies depending on your lifestyle.
C. Our chronotype is mostly hardwired into our body.
D. Our hunter-gatherer ancestors didn't have to stay up late as we do today.

hardwired=「生まれつきの、遺伝的・生物学的に組み込まれているので変えることができない」という意味なので、朝型・夜型は遺伝によるところが大きいという内容に合致する。

(7) 6 段落の内容と合致しないのは

- A. It is a big burden for teenagers to stay up late due to a lot of homework.**
B. Evening types are often put at a disadvantage.
C. Asking all the people in our society to wake up early is not reasonable.
D. Usually parents find it less hard to wake up early than their children.
ティーンネイジャーはむしろ夜遅くまで起きている方が快適で、また宿題についても言及されていないのでAが誤り。

(8) 文中の“compete” と最も意味が近いのは

- A. take part in（参加する）
B. give way to（譲り合う）
C. fight（戦う）
D. match（匹敵する、釣り合う）

同じ受容体をめぐってcompete＝競合する、という意味なのでCが正解。competeにはD：匹敵するの意味もあるが、今回の文脈にはそぐわない。

(9) 8 段落によると、カフェインによって覚醒するのは

- A. removing adenosine
B. having your system work hard for extraction
C. persisting in your body for five to seven hours
D. occupying the receptors for drowsiness-inducing chemicals.
“Caffeine and adenosine compete for the same receptors. When caffeine blocks the receptors, adenosine can no longer work to make you sleepy.”の部分を、眠気を誘発する物質であるアデノシンの受容体を占拠する、と言い換えているDが正解。Aがややこしいが、アデノシンを「取り除く」のではない。

(10) Within the whole passage, all of the following were mentioned, EXCEPT

- A. We cannot choose to be morning types or evening types.
B. REM sleep and Non-REM sleep switch at every 90 minutes.
C. Keeping consistent sleeping habit will help you sleep better.
D. Just one hour of sleep loss significantly affect our well-being.
A：5 段落の内容に合致。C：7 段落の内容に合致。consistent（＝一貫した）sleeping habitはregularityと同義。D：サマータイム開始時の影響について述べた2段落の内容に合致。レム睡眠とノンレム睡眠は、90分のサイクルの中で入れ替わるので、90分ごとに入れ替わるわけではないためBが誤り。