Ripple English
Active Learning Program

Workbook for:

“Why We Should Exercise”

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にせずに、**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 Should Exercise

1. If you think that you are too busy to spare time for exercising, perhaps you don't have time precisely because you don't exercise. It is **evident** that exercising is important for our physical health, but it is also necessary for maintaining and improving our cognitive abilities and psychological conditions. A number of studies have shown that people with regular exercise habits can enjoy greater performance and concentration, have more resilience to stress, and reduce the risk of mental illness. If you are occupied with work or study, you should actually invest time in exercising to improve your efficiency. How is brain performance related to physical activities? Why is our body designed to function better with exercising? What kind of exercise is optimal to enjoy its cerebral benefits?

(1) The word "evident" in the passage is closest in meaning to
A. proven
B. obvious
C. likely
D. fallacious

(2) According to paragraph 1, which of the following is NOT true?
A. Exercise can help improve concentration and mental resilience.
B. Physical activity plays a role in enhancing both physical and mental well-being.
C. People should avoid exercising during busy times to save energy for work or study.
D. Regular exercise may reduce the risk of mental illness.

2. Physical exercise makes us smarter. In a study done in elementary schools in Sweden, researchers compared academic performance of students who had PE lessons every day with those who had them only twice a week. Children with daily PE classes had higher scores in the first language, mathematics, and the foreign language. Similar results have been observed in studies conducted in the states of Illinois and Nebraska in the US. How does exercising contribute to enhanced intellectual performance?

3. Experiments using mice have shown that physical activity leads to increased levels of BDNF in the brain, particularly in the hippocampus. The hippocampus, located near the center of the brain, plays a crucial role in the creation of new memories. BDNF stands for brain-derived neurotrophic factor, which supports the growth and survival of neurons, promotes the formation of synaptic connections, and helps delay the aging of cells. Put simply, BDNF is a molecule that helps grow memory related parts of the brain, and the best known way to increase it is physical exercise.

4. Another study on human adults has demonstrated that people who continued moderate to high-intensity exercise for a year showed a 2 percent increase in hippocampal volume, while those who didn't exercise experienced a 1.4 percent decrease. The hippocampus typically shrinks with aging, but regular exercise can prevent or even reverse it. To gain this benefit, you need to perform moderately intense aerobic exercise, such as brisk walking, jogging, or swimming, for 30 to 40 minutes, two to three times per week. If you engage in a sedentary intellectual work, you should make exercise a habit precisely to maintain your cognitive performance.

(3) According to paragraph 2, which of the following is true?
A. Physical education has no measurable effect on academic performance.
B. Studies in Sweden and the US show a positive correlation between frequent exercise and better academic results.
C. Students with fewer PE classes consistently outperformed those with daily PE classes.
D. The study in Sweden found that exercise mainly benefits physical health, not academic performance.

(4) According to paragraph 3, why is physical exercise beneficial for brain function?
A. It strengthens muscles that are connected to memory formation.
B. It decreases stress levels, which helps neurons rest.
C. It increases BDNF, a molecule that supports memory and brain cell health.
D. It prevents the hippocampus from storing unnecessary information.

(5) According to paragraph 4, which of the following is NOT true?
A. Sedentary workers should avoid exercise to preserve energy for cognitive tasks.
B. The hippocampus naturally shrinks with age, but exercise may help counteract this.
C. Regular aerobic exercise can increase hippocampal volume in adults.
D. Brisk walking and swimming are examples of beneficial aerobic exercise.

5. Physical exercise enhances our concentration. This includes both an immediate benefit right after the exercise and a long-term reward gained from regular continuous workout. The short-term benefit involves dopamine, which functions like internal currency within the brain's reward and attention systems. The brain can continuously direct its interest and attention to a certain object when an appropriate level of dopamine circulates through the relevant regions. Several studies have shown that the level of dopamine increases after physical activities, and it continues for a few hours. As a result, dopamine reaches the core regions of the reward system, making it easier to stay focused.

6. As for the long-term benefit, regular exercising habits have been shown to increase the volume of the prefrontal cortex. This region works as a supervisor of the whole brain. It is responsible for directing attention exclusively to relevant information and exercising self-control for long-term goals rather than immediate **impulses**. When you are overwhelmed with numerous tasks, the prefrontal cortex helps you prioritize them and focus on each task one by one. When you are distracted by a notification from your phone while studying, this region judges whether to react to or ignore it. This critical part of the brain is enhanced by a regular exercising habit.

7. The reason why exercise fine-tunes our attention lies in the hunter-gatherer lifestyle of our ancestors. Whether it was running after prey or collecting nuts in a dangerous wood, it involved physical activities on which their survival depended. When our ancestors failed to choose the right target of their attention while moving, it meant their death. Therefore, the brain has evolved to optimize its focus during intense physical activities.

(6) According to paragraph 5, how does physical exercise help improve concentration?

A. It clears the mind by exhausting physical energy.
B. It increases dopamine levels, which support the brain's attention system.
C. It diverts attention away from stress and negative emotions.
D. It reduces the need for mental stimulation from external sources.

(7) The word "impulse" in the passage is closest in meaning to

A. expulsion
B. reward
C. profit
D. urge

(8) According to paragraph 7, which of the following is true?

A. The prefrontal cortex helps the brain react to every impulse immediately.
B. Regular exercise strengthens the prefrontal cortex, improving focus and self-control.
C. The prefrontal cortex is not involved in managing attention or decision-making.
D. Regular exercise only benefits physical health, not brain function.

(9) According to paragraph 7, exercise enhances our concentration because

A. exercise increases blood sugar levels, which directly stimulate the brain's attention system.
B. modern sports train our brain to multitask and process more information simultaneously.
C. focusing during exercise is a learned cultural behavior passed down through generations.
D. our brain evolved to sharpen focus during intense physical activity, which was crucial for survival.

8. Physical exercise improves our ability to deal with stress. To understand this benefit, we need to know about a hormone called cortisol. One of the major roles of this hormone is to raise the heart rate and blood pressure in response to stress stimuli. Due to the increased bloodstream, the brain and muscles can receive a lot of energy and oxygen and better deal with the threat that prompted the stress response. Cortisol is essential for our survival, but it also has some problems. Firstly, excessive or chronic increase in cortisol can lead to various harms, including neural damage, impaired activity of prefrontal cortex, and declined immune function. Secondly, the cortisol system responds not only to physical threats but also to psychological ones—especially those related to human relationships, which are a common cause of chronic cortisol exposure.

9. The good news is that regular exercise is very effective to optimize the cortisol system. Physical strain in exercising is also a form of stress, but it is short-term and beneficial to health. If you experience an increased heart rate and blood pressure on a daily basis through exercising, such stress responses are not unusual for your system. Your body becomes accustomed to stress responses, refraining from overreactions and recovering quickly to a normal state.

10. Furthermore, regular exercise reduces the amount of cortisol for the same level of stress. Habitual exercise strengthens the respiratory, circulatory, and muscular systems, improving their efficiency and thereby reducing the amount of energy and oxygen needed to produce the same output. In other words, those who exercise can perform well with less cortisol. For example, those who don't get out of breath when climbing up a staircase require less cortisol than those who become winded, and the former are likely to show lower levels of cortisol for social stressors as well. Physical exercise serves as training to minimize the secretion of the stress hormone.

(10) According to paragraph 8, what is a problem with the hormone cortisol?

A. It only reacts to physical danger and ignores psychological stress.
B. It has no real function in modern human biology.
C. Chronic elevation of cortisol can harm the brain and weaken the immune system.
D. Cortisol prevents blood and oxygen from reaching the brain and muscles.

(11) According to paragraph 9, which of the following is true?

A. Regular exercise causes long-term harmful stress on the body.
B. Physical strain from exercise trains the body to handle stress more effectively.
C. Exercise disrupts the cortisol system and weakens stress response.
D. Increased heart rate and blood pressure from exercise are signs of dangerous stress.

(12) According to paragraph 10, how does regular physical exercise affect cortisol levels?

A. It increases cortisol production to prepare for physical activity.
B. It eliminates cortisol entirely from the body.
C. It delays the body's stress response by weakening the hormone system.
D. It reduces the amount of cortisol needed to respond to stress.

11. The brain has evolved for movements. Among the vast number of species, only those who move possess a brain. Plant species don't have brains because they don't move. This intricate organ emerged 600 million years ago to **perceive** the surrounding environment and effectively navigate it. Spatial recognition and motor control involve highly complicated information processing. When our ancestral hunter-gatherers ran through the forest by dodging roots and branches, estimated the distance to prey, and threw a spear with the right angle and force, their brain had to process incredibly complex and delicate cognitive work. The brain has to recognize the changing environment through the five senses, constantly update the precise position of each body part in the perceived space, and delicately coordinate muscular movements of the whole body.

12. We can also understand the complexity of motor control by looking at the development of artificial intelligence in the last several decades. In 1997, computers had already outperformed human beings in the "intellectual" activity of figuring out the best move in the game of chess. However, it was only around 2020 when robots became capable of a seemingly simple task of picking up a chess piece and moving it to another square.

13. The brain has evolved not for work or study but for movements. All of our intellectual activities—computation, language, data analysis, and so forth—are merely secondary uses of the brain that developed for physical action. Running in the park requires far more complex cognitive activities in a far larger part of the brain than solving a crossword puzzle in a chair. It is no wonder that exercising is effective for the development and maintenance of our cognitive capacities. For those who haven't had any connections with exercise, even a 30-minute walk a day can be a good way to start. If you want to improve your brain's performance at work or study, the last thing you should do is to cut out 30 minutes of exercise to spend 30 more minutes at your desk.

(13) The word "perceive" in the passage is closest in meaning to

A. grasp
B. watch
C. change
D. communicate

(14) According to paragraph 11, why did the brain originally evolve?

A. To help early humans develop language and social relationships.
B. To store memories and perform mathematical calculations.
C. To enable movement by processing sensory input and controlling the body.
D. To support emotional regulation and self-reflection in plant species.

(15) According to paragraph 12, which of the following is NOT true?

A. Computers became better than humans at chess as early as 1997.
B. Motor control tasks, such as moving chess pieces, were easy for robots from the start.
C. It took decades after 1997 for robots to master physical manipulation of chess pieces.
D. The development of AI shows that physical tasks can be more complex than intellectual ones.

(16) According to paragraph 13, what is the best way to improve cognitive performance?

A. Engage in regular physical activity, even something as simple as a daily walk.
B. Spend extra time studying instead of exercising.
C. Focus only on intellectual tasks like puzzles and reading.
D. Train the brain through meditation and avoid physical exertion.

Answers

(1) B
(2) C
(3) B
(4) C
(5) A
(6) B
(7) D
(8) B
(9) D
(10) C
(11) B
(12) D
(13) A
(14) C
(15) B
(16) A

(1) 文中の “evident” と意味が最も近いのは
A. proven （証明された）
B. obvious （明白な）
C. likely （可能性がある）
D. fallacious（誤った）

(2) 1段落の内容に合致しないのは？
A. Exercise can help improve concentration and mental resilience.（運動は集中力と精神的回復力の向上に役立つ）
B. Physical activity plays a role in enhancing both physical and mental well-being.（身体活動は、心身の健康増進に役立つ）
C. People should avoid exercising during busy times to save energy for work or study.（仕事や勉強のためのエネルギーを節約するため、忙しい時期の運動は避けるべきだ）
D. Regular exercise may reduce the risk of mental illness.（定期的な運動は精神疾患のリスクを軽減する可能性がある）

(3) 2段落の内容に合致するのは？
A. Physical education has no measurable effect on academic performance.（体育は学業成績に測定可能な効果を及ぼさない）
B. Studies in Sweden and the US show a positive correlation between frequent exercise and better academic results.（スウェーデンとアメリカの研究では、頻繁な運動と学業成績の向上との間に正の相関関係があることが示されている）
C. Students with fewer PE classes consistently outperformed those with daily PE classes.（体育の授業が少ない生徒は、毎日体育の授業を受ける生徒よりも一貫して成績が良かった）
D. The study in Sweden found that exercise mainly benefits physical health, not academic performance.（スウェーデンの研究では、運動は学業成績ではなく、主に身体の健康に有益であることが判明した）

(4) 3段落によると、運動はなぜ脳機能に有益か？
A. It strengthens muscles that are connected to memory formation.（記憶形成に関わる筋肉を強化する）
B. It decreases stress levels, which helps neurons rest.（ストレスレベルを下げ、ニューロンの休息を助ける）
C. It increases BDNF, a molecule that supports memory and brain cell health.（記憶と脳細胞の健康を支える分子であるBDNFを増加させる）
D. It prevents the hippocampus from storing unnecessary information.（海馬が不要な情報を蓄積するのを防ぐ）

(5) 4段落の内容に合致しないのは？
A. Sedentary workers should avoid exercise to preserve energy for cognitive tasks.（座り仕事の人は、認知作業のためのエネルギーを温存するために運動を避けるべき）
B. The hippocampus naturally shrinks with age, but exercise may help counteract this.（海馬は加齢とともに自然に縮小するが、運動はこれを防ぐのに役立つ可能性がある）
C. Regular aerobic exercise can increase hippocampal volume in adults.（定期的な有酸素運動は、成人の海馬の容積を増加させる可能性がある）
D. Brisk walking and swimming are examples of beneficial aerobic exercise.（早歩きや水泳は、有益な有酸素運動の例だ）

(6) 5段落によると、運動はどのように集中力を高めるのに役立つか？
A. It clears the mind by exhausting physical energy.（身体的なエネルギーを消費することで、心をクリアにする）
B. It increases dopamine levels, which support the brain’s attention system.（脳の注意力システムをサポートするドーパミンのレベルを高める）
C. It diverts attention away from stress and negative emotions.（ストレスや否定的な感情から注意をそらす）
D. It reduces the need for mental stimulation from external sources.（外部からの精神刺激の必要性を減らす）

(7) 文中の “impulse” に意味が最も近いのは
A. expulsion（排除、放逐）
B. reward （報酬）
C. profit（利益）
D. urge（衝動）

(8) 7段落の内容に合致するのは？
A. The prefrontal cortex helps the brain react to every impulse immediately.（前頭前皮質は、脳があらゆる衝動に即座に反応するのを助ける）
B. Regular exercise strengthens the prefrontal cortex, improving focus and self-control.（定期的な運動は前頭前皮質を強化し、集中力と自制心を向上させる）
C. The prefrontal cortex is not involved in managing attention or decision-making.（前頭前皮質は注意力や意思決定の管理には関与していない）
D. Regular exercise only benefits physical health, not brain function.（定期的な運動は身体の健康にのみ有益であり、脳機能には有益ではない）

(9) 7段落によると、運動が集中力を高める理由は

A. exercise increases blood sugar levels, which directly stimulate the brain's attention system.（運動は血糖値を上昇させ、それが脳の注意システムを直接刺激する）

B. modern sports train our brain to multitask and process more information simultaneously.（現代のスポーツは、私たちの脳をマルチタスク化し、より多くの情報を同時に処理するように訓練する）

C. focusing during exercise is a learned cultural behavior passed down through generations.（運動中に集中することは、世代を超えて受け継がれてきた文化的行動である）

D. our brain evolved to sharpen focus during intense physical activity, which was crucial for survival.（私たちの脳は、激しい身体活動中に集中力を高めるように進化しており、これは生存に不可欠であった）

(10) 8段落によると、コルチゾールというホルモンの問題点は何か？

A. It only reacts to physical danger and ignores psychological stress.（コルチゾールは身体的な危険にのみ反応し、心理的なストレスには反応しない）

B. It has no real function in modern human biology.（現代の人間の生物学的機能には実質的な役割がない）

C. Chronic elevation of cortisol can harm the brain and weaken the immune system.（コルチゾールの慢性的な高値は脳に害を及ぼし、免疫系を弱める可能性がある）

D. Cortisol prevents blood and oxygen from reaching the brain and muscles.（コルチゾールは脳と筋肉への血液と酸素の供給を妨げる）

(11) 9段落の内容に合致するのは？

A. Regular exercise causes long-term harmful stress on the body.（定期的な運動は、身体に長期的な有害なストレスを与える）

B. Physical strain from exercise trains the body to handle stress more effectively.（運動による身体的負担は、身体がより効果的にストレスに対処できるように鍛える）

C. Exercise disrupts the cortisol system and weakens stress response.（運動はコルチゾール系を混乱させ、ストレス反応を弱める）

D. Increased heart rate and blood pressure from exercise are signs of dangerous stress.（運動による心拍数と血圧の上昇は、危険なストレスの兆候だ）

(12) 10段落によると、定期的な運動はコルチゾール値にどのような影響を与えるか？

A. It increases cortisol production to prepare for physical activity.（運動に備えてコルチゾールの生成を増加させる）

B. It eliminates cortisol entirely from the body.（コルチゾールを体内から完全に排出させる）

C. It delays the body's stress response by weakening the hormone system.（ホルモン系を弱めることで、体のストレス反応を遅らせる）

D. It reduces the amount of cortisol needed to respond to stress.（ストレスへの対応に必要なコルチゾールの量を減らす）

(13)文中の"perceive" と意味が最も近いのは

A. grasp（把握する）

B. watch （見る）

C. change（変える）

D. communicate（伝える）

(14) 11段落によれば、脳はそもそもなぜ進化したのか？

A. To help early humans develop language and social relationships.（初期の人類が言語と社会関係を発達させるのを助けるため）

B. To store memories and perform mathematical calculations.（記憶を保存し、数学的な計算を行うため）

C. To enable movement by processing sensory input and controlling the body.（感覚入力を処理し、身体を制御することで運動を可能にするため）

D. To support emotional regulation and self-reflection in plant species.（植物種における感情の調節と自己反省をサポートするため）

(15) 12段落の内容に合致しないのは？

A. Computers became better than humans at chess as early as 1997.（コンピュータは1997年には既にチェスで人間よりも上手になった）

B. Motor control tasks, such as moving chess pieces, were easy for robots from the start.（チェスの駒を動かすなどの運動制御タスクは、最初からロボットにとって容易だった）

C. It took decades after 1997 for robots to master physical manipulation of chess pieces.（ロボットがチェスの駒の物理的な操作を習得するには、1997年から数十年かかった）

D. The development of AI shows that physical tasks can be more complex than intellectual ones.（AIの発展は、物理的なタスクが知的なタスクよりも複雑になり得ることを示している）

(16) 13段落によると、認知能力を向上させる最善の方法は何か？

A. Engage in regular physical activity, even something as simple as a daily walk.（毎日の散歩のような簡単なことでもよいので、定期的に身体活動を行う）

B. Spend extra time studying instead of exercising.（運動する代わりに、勉強に多くの時間を費やす）

C. Focus only on intellectual tasks like puzzles and reading.（パズルや読書などの知的な課題だけに集中する）

D. Train the brain through meditation and avoid physical exertion.（瞑想を通して脳を鍛え、身体的な運動を避ける）