

READING

Time: 30 minutes

Task 1

Read the passage and answer the questions (11–20) that follow.

Scientific research reveals hidden benefits of regular exercise

Concerns that children in developed countries are leading increasingly sedentary lifestyles are growing. Recent research suggests that almost nine in ten children fail to get the 60 minutes of daily exercise which is the minimum recommended for good health, and a third completed less than an hour each week.

In most cases, this is because they are spending hours every day glued to televisions, the Internet and games consoles. Alarming, there is evidence to suggest that this lack of exercise is not only having a negative physiological effect on them, but is also adversely affecting their academic performance at school.

Psychologist Dr Aric Sigman believes that regular exercise can significantly improve pupils' academic ability, and suggests that access to high-quality PE lessons is just as likely to have a long-term impact on children's education as time spent in conventional classrooms. He also supports the long-held conviction that vigorous physical activity is much better than moderate activity. 'Children should spend at least an hour a day doing some form of vigorous exercise,' he says. And his message to schools and parents is obvious. 'Schools and parents should devise ways of increasing physical activity in and out of school time.' This, he believes, is the key to improved academic performance.

For those who are sceptical about this, and no doubt there are many, he quotes two pieces of research that underline the link between physical activity and brain capacity. One study compared brain capacity and test scores among two groups of nine- and ten-year-olds, one with higher levels of physical fitness than the other. It revealed that fitter pupils had a twelve percent larger brain capacity than their peers, which was associated with better performance in cognitive tests. They were able to complete the test more quickly and got more answers correct. A second study of 1.2 million male teenagers in Sweden was perhaps even more revealing. It found that those who were fit were more likely to have a high IQ and go on to university.

Dr Sigman says, 'Physical activity is thought to help a child's cognitive processes by increasing blood and oxygen flow to the brain. This increases levels of chemicals like endorphin in the brain which decrease stress and

improve mood. It also increases growth factors that help create new nerve cells and support the connections between brain cell synapses that are the basis of learning.

According to other researchers, there is also evidence that suggests regular exercise can increase the size of crucial parts of the brain, and that children who are fit also tend to be better at multi-tasking and performing difficult mental tasks than their unfit friends.

Professor Art Kramer, director of the Beckman Institute for Advanced Science and Technology at the University of Illinois, who led the research, said their findings could have important implications for improving children's performance at school. He said it could also be used to help people combat memory loss and retain problem-solving skills in old age.

'It is a sad fact of ageing that our brain function decreases as we get older,' says Kramer. 'Increasingly, people are also living more sedentary lifestyles. While we know that exercise can have positive effects on cardiovascular disease and diabetes, we have found it can also bring about improvements in cognition and brain function. Aerobic exercise is best for this, so by starting off doing 15 minutes a day and working up to 45 minutes to an hour of continuous exercising, we can see some real improvements in cognition after six months to a year.'

Professor Kramer's team did a lot of neuroimaging work alongside their studies, which provided visual evidence to show that brain networks and structures actually change with exercise. This, they say, is the reason why their aerobically-fit test subjects were found to exhibit superior cognitive control to those who were less fit, and that regular exercise helped to improve memory, attention and an increased ability to multi-task. The hippocampus, that part of the brain involved in memory, of elderly people who exercised regularly for more than six months increased by two percent, effectively reversing brain ageing by one to two years.

Tests carried out on children also yielded some interesting results. One test involved them crossing a 'street' using a virtual reality simulation. Fitter children were better at crossing the street when distracted by music or holding a conversation on a hands-free mobile phone compared to those who were less fit. While both groups tended to walk at the same speed, the children who were less fit often misjudged the speed and distance of the computer-generated vehicles. The low fitness kids were just as good at crossing the street when it was the only thing they were doing,' says Kramer. 'If they were listening to music or talking on the headset, they performed badly. They often ended up with the screen going red to show they had been hit. One way to look at it is that fit children think more efficiently and so are better at multi-tasking.'

Professor Kramer presented his findings at the American Association for the Advancement of Science annual meeting in Vancouver, where other research presented showed that reducing the number of calories we consume could help

to prevent brain disorders, especially in the elderly. Dr Mark Mattson, a neuroscientist from the National Institute of Ageing in Baltimore found that restricting people's diets to just 500 calories every other day increased production of proteins that are known to protect neurons from damage. 'There is considerable evidence that doing this is not only good for your heart, but is also good for your brain', he said.

Questions 11–15

Do the following statements agree with the claims of the writer?

Choose

YES if the statement agrees with the claims of the writer

NO if the statement contradicts the claims of the writer

NOT GIVEN if it is impossible to say what the writer thinks about this

- 11 The possible impact of a sedentary lifestyle on the way children perform in the classroom is very worrying.
- 12 It is only recently that people have discovered exercise is more beneficial for you when you put more effort into it.
- 13 It is unclear what Dr Aric Sigman thinks schools and parents should do.
- 14 There are probably a lot of people who disbelieve Dr Sigman's theory.
- 15 Researchers were surprised to discover a link between levels of fitness in Swedish teenagers and their IQ.

Questions 16–20

Complete the summary using the list of words, A-I, below.

Dr Sigman believes that when children do physical exercise, they experience less **16** as a result of a chemical change caused by increased blood and oxygen flow to the brain. Other researchers, such as Professor Art Kramer, think there is **17** that some parts of the brain become bigger, and fit children are better than unfit children at doing complicated **18** that require mental thought. Among other things, these scientific **19** could be used to benefit the **20** when it comes to fighting memory loss and keeping the skills that allow them to solve problems.

A ancients	D elderly	G performances
B anxiety	E exercises	H possibility
C discoveries	F anger	I proof

Task 2

Read this article and answer the questions (21–25) that follow.

Computers and technology

Has the present lived up to the expectations of the past? Throughout the ages people have tried to predict what life in the twenty-first century would be like. Many science-fiction writers did manage to predict the influence the computer would have on our world. Some even imagined that it would take over our lives, develop a personality, and turn on its creators. To some extent they were right, especially when it comes to children and cyber addiction. One constant prediction was that, thanks to computers and machines, the time devoted to labour would diminish. Even in 1971, in his book *Future Shock*, Alvin Toffler envisaged a society awash with 'free time'. The author noted that time at work had been cut in half since the turn of the previous century and wrongly speculated that it would be cut in half again by 2000.

However, our gadget-filled homes are a tribute to the various visions of the future: the microwave oven, internet fridges with ice-cube dispensers, freezers, video monitors, climate control, dishwashers, washing machines, personal computers, wireless connections and cupboards full of instant food. These may no longer be considered cutting-edge but they have matched, if not surpassed, visions of how we would live. The domestic robot never quite happened, but if you can phone ahead to set the heating and use a remote control to operate the garage door, they may as well be redundant.

The car, of course, has failed to live up to our expectations. It has been given turbo engines, DVD players and automatic windows, but its tyres stick stubbornly to the road. Why doesn't it take off? The past promised us a flying car in various guises. In 1947 a prototype circled San Diego for more than an hour but later crashed in the desert. Some 30 patents for flying cars were registered in the US patent office last century but none of these ideas has been transformed into a commercially available vehicle.

At least communication technology in this digital age hasn't let us down. Even in the most remote areas people have access to some form of communication device. The introduction of the telephone last century changed our world, but today's mobile phones and the virtual world of the Internet have revolutionised it.

Questions 21-25

Choose **YES** if the statement agrees with the opinions in the text and **NO** if it contradicts them.

21. Alan Toffler's predictions have been proven true.

22. Household gadgets today have been a disappointment.
23. We have enough gadgets now to make robots unnecessary in the home.
24. Today's cars have fulfilled all predictions.
25. The mobile phone and the Internet have changed our world for the better.

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