IELTSFever Academic IELTS Reading Test 144

Reading Passage 1

You should spend about 20 minutes on Questions 1-13, which are based on the IELTSFever Academic IELTS Reading Test 142 Reading Passage Research using twins below.

Research using twins

To biomedical researchers all over the world, twins offer a precious opportunity to untangle the influence of genes and the environment - of nature and nurture. Because identical twins come from a single fertilized egg that splits into two, they share virtually the same genetic code. Any differences between them -one twin having younger looking skin, for example - must be due to environmental factors such as less time spent in the sun.

Alternatively, by comparing the experiences of identical twins with those of fraternal twins, who come from separate eggs and share on average half their DNA, researchers can quantify the extent to which our genes affect our lives. If identical twins are more similar to each other with respect to an ailment than fraternal twins are, then vulnerability to the disease must be rooted at least in part in heredity.

These two lines of research - studying the differences between identical twins to pinpoint the influence of environment, and comparing identical twins with fraternal ones to measure the role of inheritance - have been crucial to understanding the interplay of nature and nurture in determining our personalities, behavior, and vulnerability to disease.

The idea of using twins to measure the influence of heredity dates back to 1875, when the English scientist Francis Gaitan first suggested the approach (and coined the phrase 'nature and nurture'). But twin studies took a surprising twist in the 1980s, with the arrival of studies into identical twins who had been separated at birth and reunited as adults. Over two decades 137 sets of twins eventually visited Thomas Bouchard's lab in what became known as the Minnesota Study of Twins Reared Apart. Numerous tests were carried out on the twins, and they were each asked more than 15,000 questions.

Bouchard and his colleagues used this mountain of data to identify how far twins were affected by their genetic makeup. The key to their approach was a statistical concept called heritability. In broad terms, the heritability of a trait measures the extent to which differences among members of a population can be explained by differences in their genetics. And wherever Bouchard and other scientists looked, it seemed, they found the invisible hand of genetic influence helping to shape our lives.

Lately, however, twin studies have helped lead scientists to a radical new conclusion: that nature and nurture are not the only elemental forces at work. According to a recent field called

epigenetics, there is a third factor also in play, one that in some cases serves as a bridge between the environment and our genes, and in others operates on its own to shape who we are.

Epigenetic processes are chemical reactions tied to neither nature nor nurture but representing

what researchers have called a 'third component'. These reactions influence how our genetic code is expressed: how each gene is strengthened or weakened, even turned on or off, to build our bones, brains and all the other parts of our bodies.

If you think of our DNA as an immense piano keyboard and our genes as the keys - each key symbolizing a segment of DNA responsible for a particular note, or trait, and all the keys combining to make us who we are - then epigenetic processes determine when and how each key can be struck, changing the tune being played.

One way the study of epigenetics is revolutionizing our understanding of biology is by revealing a mechanism by which the environment directly impacts on genes. Studies of animals, for example, have shown that when a rat experiences stress during pregnancy, it can cause epigenetic changes in a fetus that lead to behavioral problems as the rodent grows up. Other epigenetic processes appear to occur randomly, while others are normal, such as those that guide embryonic cells as they become heart, brain, or liver cells, for example.

Geneticist Danielle Reed has worked with many twins over the years and thought deeply about what twin studies have taught us. 'It's very clear when you look at twins that much of what they share is hardwired,' she says. 'Many things about them are absolutely the same and unalterable. But it's also clear, when you get to know them, that other things about them are different. Epigenetics is the origin of a lot of those differences, in my view.'

Reed credits Thomas Bouchard's work for today's surge in twin studies. ' He was the trailblazer ,' she says. 'We forget that 50 years ago things like heart disease were thought to be caused entirely by lifestyle. Schizophrenia was thought to be due to poor mothering. Twin studies have allowed us to be more reflective about what people are actually born with and what's caused by experience.'

Having said that, Reed adds, the latest work in epigenetics promises to take our understanding even further. 'What I like to say is that nature writes some things in pencil and some things in pen,' she says. 'Things written in pen you can't change. That's DNA. But things written in pencil you can. That's epigenetics. Now that we're actually able to look at the DNA and see where the pencil writings are, it's sort of a whole new world.'

Questions 1-4

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

In boxes 1-4 on your answer sheet, write

TRUE	if the statement is True
FALSE	if the statement is false
NOT GIVEN	If the information is not given in the passage

(1) There may be genetic causes for the differences in how young the skin of identical twins looks.

(2) Twins are at greater risk of developing certain illnesses than non-twins.

(3) Bouchard advertised in newspapers for twins who had been separated at birth.

(4) Epigenetic processes are different from both genetic and environmental processes.

Questions 5-9

Look at the following statements (Questions 5-9) and the list of researchers below.

Match each statement with the correct researcher, A, B or C.

Write the correct letter, A, B or C, in boxes 5-9 on your answer sheet.

NB You may use any letter more than once.

List of Researchers

(A) Francis Gaitan

(B) Thomas Bouchard

(C) Danielie Reed

(5) invented a term used to distinguish two factors affecting human characteristics

(6) expressed the view that the study of epigenetics will increase our knowledge

(7) developed a mathematical method of measuring genetic influences

(8) pioneered research into genetics using twins

(9) carried out research into twins who had lived apart

Questions 10-13

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

Write the correct letter, A-F, in boxes 10-13 on your answer sheet.

Epigenetic processes

In epigenetic processes, **10**..... influence the activity of our genes, for example in creating our internal **11**..... The study of epigenetic processes is uncovering a way in which our genes can be affected by our **12**..... One example is that if a pregnant rat suffers stress, the new-born rat may later show problems in its **13** .....

A nurture	B organs	C code
D chemicals	E environment	F behaviour/behavior

Reading Passage 2

You should spend about 20 minutes on Questions 14-26, which are based on the IELTSFever Academic IELTS Reading Test 144 Reading Passage. Is it time to halt the rising tide of plastic packaging? Below.

Is it time to halt the rising tide of plastic packaging?

{A}. Close up, plastic packaging can be a marvellous thing. Those who make a living from it call it a forgotten infrastructure that allows modern urban life to exist. Plastics have helped society defy natural limits such as the seasons, the rotting of food and the distance most of us live from where our food is produced. And yet we do not like it. Partly we do not like waste, but plastic waste, with its hydrocarbon roots and industrial manufacture, is especially galling. In 2008, the UK, for example, produced around two million tonnes of plastic waste, twice as much as in the early 1990s. The very qualities of plastic – its cheapness, its indestructible aura – make it a reproachful symbol of an unsustainable way of life.

{B}. The facts, however, do not justify our unease. All plastics are, at least theoretically, recyclable. Plastic packaging makes up just 6 to 7 per cent of the contents of British dustbins by weight and less than 3 percent of landfills. Supermarkets and brands, which are under pressure to reduce the quantity of packaging of all types that they use, are finding good environmental reasons to turn to plastic: it is lighter, so requires less energy for transportation than glass, for example; it requires relatively little energy to produce, and it is often re-usable. An Austrian study found that if plastic packaging were removed from the tire supply chain, other packaging would have to increase fourfold to make up for it. So are we just wrong about plastic packaging?

{C}. Is it time to stop worrying and learn to love the disposable plastic wrapping around sandwiches? Certainly, there are bigger targets for environmental savings such as improving household insulation and energy emissions. Naturally, the tire plastics industry is keen to point them out. What's more, concern over plastic packaging has produced a squall of conflicting initiatives from retailers, manufacturers, and local authorities. It's a squall that dies down and then blows harder from one month to the next. 'It is being left to the individual conscience and supermarkets playing the market,' says Tim Lang, a professor specializing in food polio'. 'It's a mess.'

{D}. Dick Scarle of the Packaging Federation points out that societies without sophisticated packaging lose all their food before it reaches consumers and that in the UK, waste in supply chains is about 3 per cent. In India, it is more than 50 per cent. The difference comes later: the British throw out 30 percent of the food they buy – an environmental cost in terms of emissions equivalent to a fifth of the cars on their roads. Packagers agree that cardboard, metals, and glass all have their good points, but there's nothing quite like plastic. With more than 20 families of polymers to choose from and then sometimes blend, packaging designers and manufacturers have a limitless variety of qualities to play with.

{E}. But if there is one law of plastic that, in environmental terms at least, prevails over all others, it is this: a little goes a long way. This means, first, that plastic is relatively cheap to use – it represents just over one-third of the UK packaging market by value but it wraps more than half the total number of items bought. Second, it means that even though plastic encases about 53 per cent of products bought, it only makes up 20 per cent by weight of the packaging consumed. And in the packaging equation, weight is the main issue because the heavier something is, the more energy you expend moving it around. Because of this, righteous indignation against plastic can look foolish.

{F}. One store commissioned a study to find precise data on which had a less environmental impact: selling apples loose or ready-wrapped. Helene Roberts, head of packaging, explains that in fact, they found apples in fours on a tray covered by plastic film needed 27 per cent less packaging in transportation than those sold loose. Sieve Kelsey, a packaging designer, finds die debate frustrating. He argues that the hunger to do something quickly is diverting effort away from more complicated questions about how you truly alter supply chains. Rather than further reducing the weight of a plastic bottle, more thought should be given to how packaging can be recycled. Helene Roberts explains that their greatest packaging reduction came when the

company switched to reusable plastic crates and stopped consuming 62,000 tonnes of cardboard boxes every year.

{G}. Plastic packaging is important, and it might provide a way of thinking about broader questions of sustainability. To target plastic on its own is to evade the complexity of the issues. There seems to be a universal eagerness to condemn plastic. Is this due to an inability to make the general changes in society that are really required? 'Plastic as a lightweight food wrapper is now built-in as the logical thing,' Lang says. 'Does that make it an environmentally sound system of packaging? It only makes sense if you have a structure such as exists now. An environmentally-driven packaging system would look completely different' Dick Scarle put the challenge another way. "The amount of packaging used today is a reflection of modern life."

Questions 14-18

Reading Passage 2 has five paragraphs A-E.

Choose the correct heading for each paragraph, A-E from the list of headings below.

Write the correct number, i-viii in boxes 14-18 on your answer sheet.

List of Headings

(i). A lack of consistent policy

(ii). Learning from experience

(iii). The greatest advantage

(iv). The role of research

(v). A unique material

(vi). An irrational anxiety

(vii). Avoiding the real challenges

(viii). A sign of things to come

Paragraph **(A)**

Paragraph **(B)**

Paragraph **(C)**

Paragraph **(D)**

Paragraph **(E)**

Questions 19-23

Look at the following statements (Questions 19-23) and the list of people below.

Match each statement to the correct person A-D.

Write the correct letter, A-D in boxes 19-23 on your answer sheet.

NB You may use any letter more than once.

(19). A comparison of two approaches to packaging revealed an interesting result.

(20). People are expected to do the right thing.

(21). Most food roaches UK shops in good condition.

(22). Complex issues are ignored in the search for speedy solutions.

(23). It is merely because of the way societies operate that using plastic seems valid.

People
(A). Tim Lang
(B). Dick Seatle
(C). Helene Roberts
(D). Steve Kelsey

Questions 24-26

Complete the summary below.

*Write **NO MORE THAN ONE WORD** from the text for each answer.*

Write your answers in boxes 24-26 on your answer sheet.

A revolutionary material

Plastic packaging has changed the way we consume food. However, we instinctively dislike it partly because it is the product of **24** ..... processes, but also because it seems

to be **25** ..... so we feel it is wasteful. Nevertheless, it is thanks to plastic that for many people their choice of food is no longer restricted by the **26** ..... in which it is available or the location of its source.

Reading Passage 3

You should spend about 20 minutes on Questions 27-40, which are based on the IELTSFever Academic IELTS Reading Test 144 Reading Passage When evolution runs backwards below.

When evolution runs backwards

Evolution isn't supposed to run backwards - yet an increasing number of examples show that it does and that it can sometimes represent the future of a species.

The description of any animal as an 'evolutionary throwback' is controversial. For the better part of a century, most biologists have been reluctant to use those words, mindful of a principle of evolution that says 'evolution cannot run backwards. But as more and more examples come to light and modern genetics enters the scene, that principle is having to be rewritten. Not only are evolutionary throwbacks possible, they sometimes play an important role in the forward march of evolution.

The technical term for an evolutionary throwback is an 'atavism', from the Latin atavus, meaning forefather. The word has ugly connotations thanks largely to Cesare Lombroso, a 19th-century Italian medic who argued that criminals were born not made and could be identified by certain physical features that were throwbacks to a primitive, subhuman state.

While Lombroso was measuring criminals, a Belgian palaeontologist called Louis Dalla was studying fossil records and coming to the opposite conclusion. In 1890 he proposed that evolution was irreversible: that 'an organism is unable to return, even partially, to a previous stage already realised in the ranks of its ancestors. Early 20th-century biologists came to a similar conclusion, though they qualified it in terms of probability, stating that there is no reason why evolution cannot run backwards -it is just very unlikely. And so the idea of irreversibility in evolution stuck and came to be known as 'Della's law.

If Della's law is right, atavisms should occur only very rarely, if at all. Yet almost since the idea took root, exceptions have been cropping up. In 1919, for example, a humpback whale with a pair of leg-like appendages over a metre long, complete with a full set of limb bones, was caught off Vancouver Island in Canada. Explorer Roy Chapman Andrews argued at the time that the whale must be a throwback to a land-living ancestor. 'I can see no other explanation, 'he wrote in 1921.

Since then, so many other examples have been discovered that it no longer makes sense to say that evolution is as good as irreversible. And this poses a puzzle: how can characteristics that disappeared millions of years ago suddenly reappear? In 1994, Rudolf Raff and colleagues at Indiana University in the USA decided to use genetics to put a number on the probability of evolution going into reverse. They reasoned that while some evolutionary changes involve the loss of genes and are therefore irreversible, others may be the result of genes being switched off. If these silent genes are somehow switched back on, they argued, long lost traits could reappear.

Raff's team went on to calculate the likelihood of it happening. Silent genes accumulate random mutations, they reasoned, eventually rendering them useless. So how long can a gene survive in a species if it is no longer used? The team calculated that there is a good chance of silent genes surviving for up to 6 million years in at least a few individuals in a population, and that some might survive as long as 10 million years. In other words, throwbacks are possible, but only to the relatively recent evolutionary past.

As a possible example, the team pointed to the mole salamanders of Mexico and California. Like most amphibians these begin life in a juvenile 'tadpole' state, then metamorphose into the adult form - except for one species, the axolotl, which famously lives its entire life as a juvenile. The simplest explanation for this is that the axolotl lineage alone lost the ability to metamorphose, while others retained it. From a detailed analysis of the salamanders' family tree, however, it is clear that the other lineages evolved from an ancestor that itself had lost the ability to metamorphose. In other words, metamorphosis in mole salamanders is an atavism. The salamander example fits with Raff's lOmillion-year time frame.

More recently, however, examples have been reported that break the time limit, suggesting that silent genes may not be the whole story. In a paper published last year, biologist Gunter Wagner of Yale University reported some work on the evolutionary history of a group of South American lizards called Bachia. Many of these have minuscule limbs; some look more like snakes than lizards and a few have completely lost the toes on their hind limbs. Other species, however, sport up to four toes on their hind legs. The simplest explanation is that the toed Hinges never lost their toes, but Wagner begs to differ. According to his analysis of the Bachia family tree, the toed species re-evolved toes from toeless ancestors and, what is more, digit loss and gain has occurred on more than one occasion over tens of millions of years .

So what's going on? One possibility is that these traits are lost and then simply reappear, in much the same way that similar structures can independently arise in unrelated species, such as the dorsal fins of sharks and killer whales. Another more intriguing possibility is that the genetic information needed to make toes somehow survived for tens or perhaps hundreds of millions of years in the lizards and was reactivated. These atavistic traits provided an advantage and spread through the population, effectively reversing evolution.

But if silent genes degrade within 6 to million years, how can long-lost traits be reactivated over longer timescales? The answer may lie in the womb. Early embryos of many species develop ancestral features. Snake embryos, for example, sprout hind limb buds. Later in development

these features disappear thanks to developmental programs that say 'lose the leg'. If for any reason this does not happen, the ancestral feature may not disappear, leading to an atavism.

Questions 27-31:

Choose the correct letter, A, B, C or D. Write the correct letter in boxes 27-31 on your answer sheet.

Question 27 When discussing the theory developed by Louis Dolio, the writer says that

(A) it was immediately referred to as Dollo's law.

(B) it supported the possibility of evolutionary throwbacks.

(C) it was modified by biologists in the early twentieth century.

(D) it was based on many years of research.

Question 28 The humpback whale caught off Vancouver Island is mentioned because of

(A) the exceptional size of its body.

(B) the way it exemplifies Dollo's law.

(C) the amount of local controversy it caused.

(D) the reason given for its unusual features.

Question 29 What is said about 'silent genes'?

(A) Their numbers vary according to species.

(B) Raff disagreed with the use of the term.

(C) They could lead to the re-emergence of certain characteristics.

(D) They can have an unlimited life span.

Question 30 The writer mentions the mole salamander because

(A) it exemplifies what happens in the development of most amphibians.

(B) it suggests that Raffs theory is correct.

(C) it has lost and regained more than one ability.

(D) its ancestors have become the subject of extensive research.

Question 31 Which of the following does Wagner claim?

(A) Members of the Bachia lizard family have lost and regained certain features several times.

(B) Evidence shows that the evolution of the Bachia lizard is due to the environment.

(C) His research into South American lizards supports Raffs assertions.

(D) His findings will apply to other species of South American lizards.

Questions 32-36:

Complete each sentence with the correct ending, A-G, below.

Write the correct letter, A-G, in boxes 32-36 on your answer sheet.

(32) For a long time biologists rejected

(33) Opposing views on evolutionary throwbacks are represented by

(34) Examples of evolutionary throwbacks have led to

(35) The shark and killer whale are mentioned to exemplify

(36) One explanation for the findings of Wagner's research is

(A) the question of how certain long-lost traits could reappear.

(B) the occurrence of a particular feature in different species.

(C) parallels drawn between behaviour and appearance.

(D) the continued existence of certain genetic information.

(E) the doubts felt about evolutionary throwbacks.

(F) the possibility of evolution being reversible.

(G) Dollo's findings and the convictions held by Lombroso.

Questions 37 - 40:

Do the following statements agree with the claims of the writer in Reading Passage 37 In boxes 37 - 40 on your answer sheet, write

YES	if the statement agrees with the writer
NO	if the statement does not agree with the writer
NOT GIVEN	if there is no information about this in the passage

(37) Wagner was the first person to do research on South American lizards.

(38) Wagner believes that Bachia lizards with toes had toeless ancestors.

(39) The temporary occurrence of long-lost traits in embryos is rare.

(40) Evolutionary throwbacks might be caused by developmental problems in the womb.