

# IELTS Academic Reading Sample 62 - Endangered chocolate

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You should spend about 20 minutes on Questions 1-13 which are based on the Reading Passage below.

## Endangered chocolate

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**A** The cacao tree, once native to the equatorial American forest, has some exotic traits for a plant. Slender and shrubby, the cacao has adapted to life close to the leaf littered forest floor. Its large leaves droop down, away from the sun. Cacao doesn't flower, as most plants do at the tips of its outer and uppermost branches. Instead, its sweet white buds hang from the trunk and along a few fat branches which form where leaves drop off. These tiny flowers transform into pulp-filled pods almost the size of rugby balls. The low-hanging pods contain the bitter-tasting magical seeds.

**B** Somehow, more than 2,000 years ago, ancient humans in Mesoamerica discovered the secret of these beans. If you scoop them from the pod with their pulp, let them ferment and dry in the sun, then roast them over a gentle fire, something extraordinary happens: they become chocolate. And if you then grind and press the beans, which are half-cocoa butter or more, you will obtain a rich crumbly, chestnut brown paste - chocolate at its most pure and simple.

**C** The Maya and Aztecs revered this chocolate, which they frothed up with water and spices to make bracing concoctions. It was edible treasure, offered up to their gods, used as money and hoarded like gold. Long after Spanish explorers introduced the beverage to Europe in the sixteenth century, chocolate retained an aura of aristocratic luxury. In 1753, the Swedish botanist Carolus Linnaeus gave the cacao tree genus the name *Theobroma*, which means 'food of the gods',

**D** In the last 200 years the bean has been thoroughly democratized - transformed from an elite drink into ubiquitous candy bars, cocoa powders and confections. Today chocolate is becoming more popular worldwide, with new markets opening up in Eastern Europe and Asia. This is both good news and bad because, although farmers are producing record numbers of cacao bean, this is not enough, some researchers worry, to keep pace with global demand. Cacao is also facing some alarming problems.

**E** Philippe Petithuguenin, head of the cacao program at the Centre For International Cooperation in Development-Oriented Agricultural Research (CiRAD) in France, recently addressed a seminar in the Dominican Republic. He displayed a map of the world revealing a narrow band within 180 north and south of

the equator, where cacao grows. In the four centuries since the Spanish first happened upon cacao, it has been planted all around this hot humid tropical belt - from South America and the Caribbean to West Africa, east Asia, and New Guinea and Vanuatu in the Pacific.

**F** Today 70% of all chocolate beans come from West Africa and Central Africa. In many parts, growers practice so-called pioneer Farming. They strip patches of forest of all but the tallest canopy trees and then they put in cacao, using temporary plantings of banana to shade the cacao while it's young. With luck, groves like this may produce annual yields of 50 to 60 pods per tree for 25 to 30 years. But eventually pests, pathogens and soil exhaustion take their toll and yields diminish. Then the growers move on and clear a new forest patch - unless farmers of other crops get there first. 'You cannot keep cutting tropical forest, because the forest itself is endangered: said Petithuguenin. 'World demand for chocolate increases by 3% a year on average. With a lack of land for new plantings in tropical forests, how do you meet that?'

**G** Many farmers have a more imminent worry: outrunning disease. Cacao, especially when grown in plantations, is at the mercy of many afflictions, mostly rotting diseases caused by various species of fungi which cover the pods in fungus or kill the trees. These fungi and other diseases spoil more than a quarter of the world's yearly harvest and can devastate entire cacao-growing regions.

**H** One such disease, witches broom, devastated the cacao plantations in the Bahia region of Brazil. Brazil was the third largest producer of cacao beans but in the 1980s the yields fell by 75%. According to Petithuguenin, 'if a truly devastating disease like witches broom reached West Africa (the world's largest producer), it could be catastrophic.' If another producer had the misfortune to falter now, the ripples would be felt the world over. In the United States, for example, imported cacao is the linchpin of an \$8.6 billion domestic chocolate industry that in turn supports the nation's dairy and nut industries; 20% of all dairy products in the US go into confectionery.

Today research is being carried out to try to address this problem by establishing disease resistant plants. However, even the best plants are useless if there isn't anywhere to grow them. Typically, farmers who grow cacao get a pittance for their beans compared with the profits reaped by the rest of the chocolate business. Most are at the mercy of local middlemen who buy the beans then sell them for a much higher price to the chocolate manufacturers. If the situation is to improve for farmers, these people need to be removed from the process. But the economics of cacao is rapidly changing because of the diminishing supply of beans. Some companies have realized that they need to work more closely with the farmers to ensure that sustainable farming practices are used. They need to replant areas and create a buffer for the forest, to have ground cover, shrubs and small trees as well as the canopy trees. Then the 'soil will be more robust and more productive.

They also need to empower the farmers by guaranteeing them a higher price for their beans so that they will be encouraged to grow cacao and can maintain their way of life.

### Questions 1-3

Choose the correct letter, A, B, C or D.

Write your answers in your answer sheet from 1-3

1 The flowers of the cacao plant appear

- A at the end of its top branches.
- B along all of its branches.
- C mainly on its trunk.
- D close to its leaves.

2 In Africa, banana trees are planted with the cacao plants in order to

- A replace the largest trees.
- B protect the new plants.
- C provide an extra crop.
- D help improve soil quality.

3 In paragraph H, what is the writer referring to when he says 'the ripples would be felt the world over'?

- A the impact a collapse in chocolate production could have on other industries
- B the possibility of disease spreading to other crops
- C the effects of the economy on world chocolate growers
- D the link between Brazilian growers and African growers

### Questions 4-9

The Reading Passage has nine paragraphs labelled **A-I**.

Which paragraph contains the following information?

Write the correct letter **A-I** in your answer sheet from 4-9.

- 4 a list of the cacao growing areas
- 5 an example of how disease has affected one cacao growing region
- 6 details of an ancient chocolate drink
- 7 a brief summary of how the chocolate industry has changed in modern times
- 8 the typical lifespan and crop size of a cacao plantation
- 9 a reference to the scientific identification of the cacao plant

### Questions 10-13

Complete the notes below.

Write **NO MORE THAN TWO WORDS** from the passage for each answer.

Write your answers in your answer sheet from 10-13.

#### Ways of dealing with the plant's problems

- Need to find plants which are not affected by 10\_\_\_\_\_.
- Chocolate producers need to work directly with farmers instead of 11 \_\_\_\_\_.
- Need to encourage farmers to use 12 \_\_\_\_\_ methods to grow cacao plants
- Make sure farmers receive some of the 13 \_\_\_\_\_ made by the chocolate industry

#### Answer:

1 C 2B 3A 4E 5H 6 C 7D 8 F 9C 10 disease 11 (local) middlemen 12 sustainable 13 profits

# IELTS Academic Reading Sample 63 - Dressed to Dazzle

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You should spend about 20 minutes on Questions 1-14 which are based on the Reading Passage below.

## Dressed to Dazzle

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As high-tech materials invade high-street fashion, prepare for clothes that are cooler than silk and warmer than wool, keep insects at arm's length, and emit many pinpricks of coloured light.

The convergence of fashion and high technology is leading to new kinds of fibres, fabrics and coatings that are imbuing clothing with equally wondrous powers. Corpe Nove, an Italian fashion company, has made a prototype shirt that shortens its sleeves when room temperature rises and can be ironed with a hairdryer. And at Nexia Biotechnologies, a Canadian firm, scientists have caused a stir by manufacturing spider silk from the milk of genetically engineered goats. Not surprisingly, some industry analysts think high-tech materials may soon influence fashion more profoundly than any individual designer.

A big impact is already being made at the molecular level. Nano-Tex, a subsidiary of American textiles maker Burlington, markets a portfolio of nanotechnologies that can make fabrics more durable, comfortable, wrinkle-free and stain-resistant. The notion of this technology posing a threat to the future of the clothing industry clearly does not worry popular fashion outlets such as Gap, Levi Strauss and Lands' End, all of which employ Nano-Tex's products. Meanwhile, Schoeller Textil in Germany, whose clients include famous designers Donna Karan and Polo Ralph Lauren, uses nanotechnology to create fabrics that can store or release heat.

Sensory Perception Technologies (Spn) embodies an entirely different application of nanotechnology. Created in 2003 by Quest International, a flavour and fragrance company, and Woolmark, a wool textile organisation, SPT is a new technique of embedding chemicals into fabric. Though not the first of this type, SPT's durability (evidently the microcapsule containing the chemicals can survive up to 30 washes) suggests an interesting future. Designers could incorporate signature scents into their collections. Sportswear could be impregnated with anti-perspirant. Hayfever sufferers might find relief by pulling on a T-shirt, and so on.

The loudest buzz now surrounds polylactic acid (PLA) fibres - and, in particular, one brand-named Ingeo. Developed by Cargill Dow, it is the first man-made fibre derived from a 100% annually renewable resource. This is currently maize (corn), though in theory any fermentable plant material, even potato peelings, can be used. In performance terms, the attraction for the 30-plus clothes makers signed up to use Ingeo lies in its superiority over polyester (which it was designed to replace).

As Philippa Watkins, a textiles specialist, notes, Ingeo is not a visual trend. Unlike nanotechnology, which promises to 'transform what clothes can do, Ingeo's impact on fashion will derive instead from its emphasis on using natural sustainable resources. Could wearing synthetic fabrics made from polluting and non-renewable fossil fuels become as uncool as slipping on a coat made from animal fur? Consumers should expect a much wider choice of 'green' fabrics. Alongside PLA fibres, firms are investigating plants such as bamboo, seaweed, nettles and banana stalks as raw materials for textiles. Soya bean fibre is also gaining ground. Harvested in China and spun in Europe, the fabric is a better absorber and ventilator than silk, and retains heat better than wool.

Elsewhere, fashion houses - among them Ermenegildo Zegna, Paul Smith and DKNY - are combining fashion with electronics. Clunky earlier attempts involved attaching electronic components to the fabrics after the normal weaving process. But companies such as SOFTswitch have developed electro-conductive fabrics that behave in similar ways to conventional textiles.

Could electronic garments one day change colour or pattern? A hint of what could be achieved is offered by Luminex, a joint venture between Stabio Textile and Caen. Made of woven optical fibres and powered by a small battery, Luminex fabric emits thousands of pinpricks of light, the colour of which can be varied. Costumes made of the fabric wowed audiences at a production of the opera Aida in Washington, DC, last year.

Yet this ultimate of ambitions has remained elusive in daily fashion, largely because electronic textiles capable of such wizardry are still too fragile to wear. Margaret Orth, whose firm International Fashion Machines makes a colour-changing fabric, believes the capability is a decade or two away. Accessories with this chameleon-like capacity - for instance, a handbag that alters its colour - are more likely to appear first.

### **Questions 1-6**

Look at the following list of companies (1-6) and the list of new materials below. Match each company with the correct material.

Write the correct letter **A-H** next to the companies **1-6**.

NB You may use any answer more than once.

**1 Corpe Nove**

**2 Nexia Biotechnologies**

**3 Nano-Tex**

**4 Schoeller Textil**

**5 Quest International and Wool mark**

## 6 Cargill Dow

### New materials

A material that can make you warmer or cooler

B clothing with perfume or medication added

C material that rarely needs washing

D clothes that can change according to external heat levels E material made from banana stalks

F material that is environmentally-friendly

G fibres similar to those found in nature

H clothes that can light up in the dark

### Questions 7-14

Complete the summary below.

Write **NO MORE THAN TWO WORDS** from the Reading Passage for each answer.

#### Major changes in fabrics

##### Using plants

Nanotechnology will bring changes we can see, while the brand called **7** \_\_\_\_\_ will help the environment. Fibre made from the **8** \_\_\_\_\_ plant has better qualities than silk and wool.

##### Electronics

In first attempts to use electronics, companies started with a material made by a standard **9** \_\_\_\_\_ method and then they fixed **10** \_\_\_\_\_ to the material.

##### Luminex fabric

- needs a **11** \_\_\_\_\_ to make it work.
- has already been used to make stage **12**. \_\_\_\_\_ is not suitable for everyday wear because it is too **13** \_\_\_\_\_.

The first products that can change colour are likely to be **14**. \_\_\_\_\_

**Answer:**

1 D 2G 3 C 4A 5 B 6F 7 Ingeo 8 soya bean 9 weaving 10 electronic components 11 battery 12 costumes 13 fragile 14 accessories/ handbags

# IELTS Academic Reading Sample 65 - The Little Ice Age

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You should spend about **20** minutes on Questions **14-26**, which are based on Reading Passage 65.

## Questions 14-17

Reading Passage 2 has six paragraphs, **A-F**.

Choose the correct heading for paragraphs **B** and **D-F** from the list of headings below.

Write the correct number, **i-ix**, in boxes **14-17** on your answer sheet.

### List of Headings

- i Predicting climatic changes
- ii The relevance of the Little Ice Age today
- iii How cities contribute to climate change
- iv Human impact on the climate
- v How past climatic conditions can be determined
- vi A growing need for weather records
- vii A study covering a thousand years
- viii People have always responded to climate change
- ix Enough food at last

Example	Answer
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Paragraph A	viii
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14. Paragraph B

Example	Answer
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Paragraph C	v
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15 Paragraph D

16 Paragraph E

17 Paragraph F

## THE LITTLE ICE AGE

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**A** This book will provide a detailed examination of the Little Ice Age and other climatic shifts, but, before I embark on that, let me provide a historical context. We tend to think of climate - as opposed to weather - as something unchanging, yet humanity has been at the mercy of climate change for its entire existence, with at

least eight glacial episodes in the past 730,000 years. Our ancestors adapted to the universal but irregular global warming since the end of the last great Ice Age, around 10,000 years ago, with dazzling opportunism. They developed strategies for surviving harsh drought cycles, decades of heavy rainfall or unaccustomed cold; adopted agriculture and stock-raising, which revolutionised human life; and founded the world's first pre-industrial civilisations in Egypt, Mesopotamia and the Americas. But the price of sudden climate change, in famine, disease and suffering, was often high.

**B** The Little Ice Age lasted from roughly 1300 until the middle of the nineteenth century. Only two centuries ago, Europe experienced a cycle of bitterly cold winters; mountain glaciers in the Swiss Alps were the lowest in recorded memory, and pack ice surrounded Iceland for much of the year. The climatic events of the Little Ice Age did more than help shape the modern world. They are the deeply important context for the current unprecedented global warming. The Little Ice Age was far from a deep freeze, however; rather an irregular seesaw of rapid climatic shifts, few lasting more than a quarter-century, driven by complex and still little understood interactions between the atmosphere and the ocean. The seesaw brought cycles of intensely cold winters and easterly winds, then switched abruptly to years of heavy spring and early summer rains, mild winters, and frequent Atlantic storms, or to periods of droughts, light northeasterly winds, and summer heat waves.

**C** Reconstructing the climate changes of the past is extremely difficult, because systematic weather observations began only a few centuries ago, in Europe and North America. Records from India and tropical Africa are even more recent. For the time before records began, we have only 'proxy records' reconstructed largely from tree rings and ice cores, supplemented by a few incomplete written accounts. We now have hundreds of tree-ring records from throughout the northern hemisphere, and many from south of the equator, too, amplified with a growing body of temperature data from ice cores drilled in Antarctica, Greenland, the Peruvian Andes, and other locations. We are close to a knowledge of annual summer and winter temperature variations over much of the northern hemisphere going back 600 years.

**D** This book is a narrative history of climatic shifts during the past ten centuries, and some of the ways in which people in Europe adapted to them. Part One describes the Medieval Warm Period, roughly 900 to 1200. During these three centuries, Norse voyagers from Northern Europe explored northern seas, settled Greenland, and visited North America. It was not a time of uniform warmth, for then, as always since the Great Ice Age, there were constant shifts in rainfall and temperature. Mean European temperatures were about the same as today, perhaps slightly cooler.

**E** It is known that the Little Ice Age cooling began in Greenland and the Arctic in about 1200. As the Arctic ice pack spread southward, Norse voyages to the west were rerouted into the open Atlantic, then ended altogether. Storminess increased in the North Atlantic and North Sea. Colder, much wetter weather descended

on Europe between 1315 and 1319, when thousands perished in a continent-wide famine. By 1400, the weather had become decidedly more unpredictable and stormier, with sudden shifts and lower temperatures that culminated in the cold decades of the late sixteenth century. Fish were a vital commodity in growing towns and cities, where food supplies were a constant concern. Dried cod and herring were already the staples of the European fish trade, but changes in water temperatures forced fishing fleets to work further offshore. The Basques, Dutch, and English developed the first offshore fishing boats adapted to a colder and stormier Atlantic. A gradual agricultural revolution in northern Europe stemmed from concerns over food supplies at a time of rising populations. The revolution involved intensive commercial farming and the growing of animal fodder on land not previously used for crops. The increased productivity from farmland made some countries self-sufficient in grain and livestock and offered effective protection against famine.

**F** Global temperatures began to rise slowly after 1850, with the beginning of the Modern Warm Period. There was a vast migration from Europe by land-hungry farmers and others, to which the famine caused by the Irish potato blight contributed, to North America, Australia, New Zealand, and southern Africa. Millions of hectares of forest and woodland fell before the newcomers' axes between 1850 and 1890, as intensive European farming methods expanded across the world. The unprecedented land clearance released vast quantities of carbon dioxide into the atmosphere, triggering for the first time humanly caused global warming. Temperatures climbed more rapidly in the twentieth century as the use of fossil fuels proliferated and greenhouse gas levels continued to soar. The rise has been even steeper since the early 1980s. The Little Ice Age has given way to a new climatic regime, marked by prolonged and steady warming. At the same time, extreme weather events like Category 5 hurricanes are becoming more frequent.

**Questions 18-22**

Complete the summary using the list of words, **A<sup>2</sup> 1**, below.

Write the correct letter, **A<sup>2</sup> 1**, in boxes **18-22** on your answer sheet.

**Weather during the Little Ice Age**

Documentation of past weather condition is limited: our main sources of knowledge of conditions in the distant past are **18**..... and **19**..... . We can deduce that the Little Ice Age was a time of **20** ....., rather than of consistent freezing. Within it there were some periods of very cold winters, others of **21**..... and heavy rain, and yet others that saw **22** .....with no rain at all.

**A climatic shifts**

**B ice cores**

**C tree rings**

**D glaciers**

**E interactions**

**F weather observations**

**G heat waves**

**H storms**

**I written accounts**

**Questions 23-26**

Classify the following events as occurring during the

**A** Medieval Warm Period

**B** Little Ice Age

**C** Modern Warm Period

Write the correct letter, **A**, **B** or **C**, in boxes **23-26** on your answer sheet.

**23** Many Europeans started farming abroad.

**24** The cutting down of trees began to affect the climate.

**25** Europeans discovered other lands.

**26** Changes took place in fishing patterns.

**Answer:**

14 ii

15 vii

16 ix

17 iv

18 & 19 C, B (IN EITHER ORDER)

20 A

21 H

22 G

23 C

24 C

25 A

26 B

# IELTS Academic Reading Sample 66 - Sheet Glass Manufacture: The Float Process

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You should spend about **20** minutes on Questions **1-13**, which are based on Reading Passage 66 below.

## Sheet glass manufacture: the float process

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Glass, which has been made since the time of the Mesopotamians and Egyptians, is little more than a mixture of sand, soda ash and lime. When heated to about 1500 degrees Celsius (°C) this becomes a molten mass that hardens when slowly cooled. The first successful method for making clear and flat glass involved spinning. This method was very effective as the glass had not touched any surfaces between being soft and becoming hard, so it stayed perfectly unblemished, with a 'fire finish'. However, the process took a long time and was labour intensive.

Nevertheless, demand for flat glass was very high and glassmakers across the world were looking for a method of making it continuously. The first continuous ribbon process involved squeezing molten glass through two hot rollers, similar to an old mangle. This allowed glass of virtually any thickness to be made non-stop, but the rollers would leave both sides of the glass marked, and these would then need to be ground and polished. This part of the process rubbed away around 20 per cent of the glass, and the machines were very expensive.

The float process for making flat glass was invented by Alistair Pilkington. This process allows the manufacture of clear, tinted and coated glass for buildings, and clear and tinted glass for vehicles. Pilkington had been experimenting with improving the melting process, and in 1952 he had the idea of using a bed of molten metal to form the flat glass, eliminating altogether the need for rollers within the float bath. The metal had to melt at a temperature less than the hardening point of glass (about 600°C), but could not boil at a temperature below the temperature of the molten glass (about 1500°C). The best metal for the job was tin.

The rest of the concept relied on gravity, which guaranteed that the surface of the molten metal was perfectly flat and horizontal. Consequently, when pouring molten glass onto the molten tin, the underside of the glass would also be perfectly flat. If the glass were kept hot enough, it would flow over the molten tin until the top surface was also flat, horizontal and perfectly parallel to the bottom surface. Once the glass cooled to 604°C or less it was too hard to mark and could be transported out of the cooling zone by rollers. The glass settled to a thickness of six millimetres because of surface tension interactions between the glass and the tin. By fortunate coincidence, 60 per cent of the flat glass market at that time was for six millimetre glass.

Pilkington built a pilot plant in 1953 and by 1955 he had convinced his company to build a full-scale plant. However, it took 14 months of non-stop production, costing the company £100,000 a month, before the plant produced any usable glass. Furthermore, once they succeeded in making marketable flat glass, the machine was turned off for a service to prepare it for years of continuous production. When it started up again it took another four months to get the process right again. They finally succeeded in 1959 and there are now float plants all over the world, with each able to produce around 1000 tons of glass every day, non-stop for around 15 years.

Float plants today make glass of near optical quality. Several processes <sup>2</sup> melting, refining, homogenising <sup>2</sup> take place simultaneously in the 2000 tonnes of molten glass in the furnace. They occur in separate zones in a complex glass flow driven by high temperatures. It adds up to a continuous melting process, lasting as long as 50 hours, that delivers glass smoothly and continuously to the float bath, and from there to a coating zone and finally a heat treatment zone, where stresses formed during cooling are relieved.

The principle of float glass is unchanged since the 1950s. However, the product has changed dramatically, from a single thickness of 6.8 mm to a range from sub-millimetre to 25 mm, from a ribbon frequently marred by inclusions and bubbles to almost optical perfection. To ensure the highest quality, inspection takes place at every stage. Occasionally, a bubble is not removed during refining, a sand grain refuses to melt, a tremor in the tin puts ripples into the glass ribbon. Automated on-line inspection does two things. Firstly, it reveals process faults upstream that can be corrected. Inspection-technology allows more than 100 million measurements a second to be made across the ribbon, locating flaws the unaided eye would be unable to see. Secondly, it enables computers downstream to steer cutters around flaws.

Float glass is sold by the square metre, and at the final stage computers translate customer requirements into patterns of cuts designed to minimise waste.

**Questions 1-8**

Complete the table and diagram below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Write your answers in boxes **1-8** on your answer sheet.

**Early methods of producing flat glass**

Method	Advantages	Disadvantages
<p>« « « « « « « « « «</p>	<p>‡ Glass Remained</p> <p>« « « « « « « « « «</p>	<p>‡ 6/RZ</p>

		‡ « « « « « « « «
Ribbon	‡ Could produce glass sheets of varying 4 ..... ‡ Non-stop process	‡ Glass was 5..... ‡ 20% of glass rubbed away ‡ Machines were expensive



**Questions 9-13**

Do the following statements agree with the information given in Reading Passage 109?

In boxes **9-13** on your answer sheet, write:

**TRUE** if the statement agrees with the information

**FALSE** if the statement contradicts the information

**NOT GIVEN** if there is no information on this

**9** The metal used in the float process had to have specific properties.

**10** Pilkington invested some of his own money in his float plant.

**11** Pilkington's first full-scale plant was an instant commercial success.

**12** The process invented by Pilkington has now been improved.

**13** Computers are better than humans at detecting faults in glass.

**Answer:**

1 spinning

2 (perfectly) unblemished

3 labour/labor-intensive

4 thickness

5 marked

6 (molten) glass

7 (molten) tin/metal

8 rollers

9 TRUE

10 NOT GIVEN

11 FALSE

12 TRUE

13 TRUE