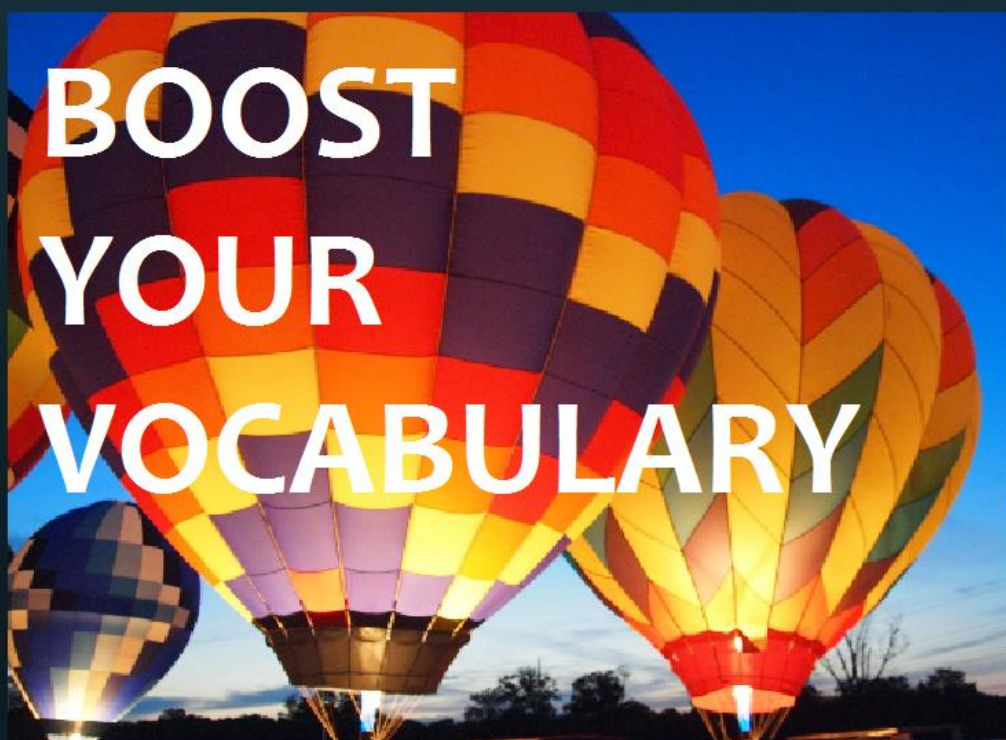


 **IELTS family**
Dinh Thang - Duong Nguyen



Help you learn the most common academic words from

CAMBRIDGE IELTS

11

LỜI GIỚI THIỆU

Chào các bạn,

Các bạn đang cầm trên tay cuốn “Boost your vocabulary” được biên soạn bởi mình và bạn [Dương Nguyễn](#). Cuốn sách được viết nhằm mục đích giúp các bạn đang muốn cải thiện vốn từ vựng cho phần thi Reading trong IELTS. Sách được viết dựa trên nền tảng bộ Cambridge IELTS của Nhà xuất bản Đại học Cambridge – Anh Quốc.

Từ lúc mình lên ý tưởng cho cuốn sách này đến khi cùng bạn Dương Nguyễn bắt đầu thực hiện, mình đã mất tương đối nhiều thời gian để nghiên cứu cách thức đưa nội dung sao cho khoa học và dễ dùng nhất với các bạn đọc. Tuy vậy, cuốn sách không khỏi có những hạn chế nhất định. Mọi góp ý để cải thiện nội dung cuốn sách mọi người xin gửi về email thangworm@gmail.com

Trân trọng cảm ơn,



dinhthangielts

NHÓM THỰC HIỆN

Đinh Thắng



Hiện tại là giáo viên dạy IELTS tại Hà Nội với các lớp học quy mô nhỏ (dưới 10 người) từ cuối năm 2012. Chứng chỉ ngành ngôn ngữ Anh, đại học Brighton, Anh Quốc, 2016. Từng làm việc tại tổ chức giáo dục quốc tế Language Link Việt Nam (2011-2012)

Facebook.com/dinhthangielts

Dương Nguyễn



Cựu sinh viên K55 Đại học Kinh tế Quốc Dân Hà Nội.

Facebook.com/duong.nguyen.9216778

03 LÝ DO TẠI SAO NÊN HỌC TỪ VỰNG THEO CUỐN SÁCH NÀY

1. Không còn mất nhiều thời gian cho việc tra từ

Các từ học thuật (academic words) trong sách đều có kèm giải thích hoặc từ đồng nghĩa. Bạn tiết kiệm được đáng kể thời gian gõ từng từ vào từ điển và tra. Chắc chắn những bạn thuộc dạng “không được chăm chỉ lắm trong việc tra từ vựng” sẽ thích điều này.

2. Tập trung bộ nhớ vào các từ quan trọng

Mặc dù cuốn sách không tra hết các từ giúp bạn nhưng sách đã chọn ra các từ quan trọng và phổ biến nhất giúp bạn. Như vậy, bạn có thể tập trung bộ nhớ vào các từ này, thay vì phải mất công nhớ các từ không quan trọng. Bạn nào đạt Reading từ 7.0 trở lên đều sẽ thấy rất nhiều trong số các từ này thuộc loại hết sức quen thuộc

3. Học một từ nhớ nhiều từ

Rất nhiều từ được trình bày theo synonym (từ đồng nghĩa), giúp các bạn có thể xem lại và học thêm các từ có nghĩa tương đương hoặc giống như từ gốc. Có thể nói, đây là phương pháp học hết sức hiệu quả vì khi học một từ như impact, bạn có thể nhớ lại hoặc học thêm một loạt các từ nghĩa tương đương như significant, vital, imperative, chief, key. Nói theo cách khác thì nếu khả năng ghi nhớ của bạn tốt thì cuốn sách này giúp bạn đẩy số lượng từ vựng lên một cách đáng kể.

HƯỚNG DẪN SỬ DỤNG SÁCH

ĐỐI TƯỢNG SỬ DỤNG SÁCH

Nhìn chung các bạn cần có mức độ từ vựng tương đương 5.5 trở lên (theo thang điểm 9 của IELTS), nếu không có thể sẽ gặp nhiều khó khăn trong việc sử dụng sách này.

CÁC BƯỚC SỬ DỤNG

Bước 1: Bạn in cuốn sách này ra. Nên in bìa màu để có thêm động lực học. Cuốn sách được thiết kế cho việc đọc trực tiếp, không phải cho việc đọc online nên bạn nào đọc online sẽ có thể thấy khá bất tiện khi tra cứu, đối chiếu từ vựng

Bước 2: Tìm mua cuốn Cambridge IELTS (6 cuốn mới nhất từ 6-12) của Nhà xuất bản Cambridge để làm. Hãy cẩn thận đừng mua nhầm sách lậu. Sách của nhà xuất bản Cambridge được tái bản tại Việt Nam thường có bìa và giấy dày, chữ rất rõ nét.

Bước 3: Làm một bài test hoặc passage bất kỳ trong bộ sách trên. Ví dụ passage 1, test 1 của Cambridge IELTS 12.

Bước 4: Đối chiếu với cuốn sách này, bạn sẽ lọc ra các từ vựng quan trọng cần học.

Ví dụ passage 1, test 1 của Cambridge IELTS 12, bài về CORK: Bạn sẽ thấy

4.1 Cột bên trái là bản text gốc, trong đó gạch chân các từ vựng học thuật CO' BẢN trong list 570 academic word mà nhiều bạn chắc đã từng nghe nói đến.

4.2 Cột bên phải chứa các từ vựng học thuật (academic words) theo kèm định nghĩa (definition) hoặc từ đồng nghĩa (synonym)

Trong đó các từ đóng vai trò quan trọng trong việc giúp người đọc hiểu nội dung của text (important words) được giải thích. Các từ này có thể nằm trong hoặc không nằm trong list 570 từ phía trên.

Nguyên nhân vì

- Khá nhiều từ trong list 570 từ vựng thuộc loại rất phổ biến (VD: individual, structure, technology, energy, v.v...) nên các từ này tất nhiên không được giải thích ở cột bên phải.

- Khổ giấy có hạn, rất khó để trình bày hết các từ. Giả sử trình bày hết các từ thì trông cũng rất rối. Ở đây cuốn sách đặc biệt phục vụ cho các bạn đang ở tầm 6.5-7.0 về từ vựng.

** Tài liệu này nên được in ra để thuận tiện cho việc học*

*** Lúc học, nên dùng kèm bút highlight/bút đỏ/bút chì để đánh dấu từ, như vậy sẽ đỡ bận mắt lúc đọc và tra cứu.*

**** Tránh mua/bán tài liệu này dưới mọi hình thức.*

Cambridge 11

Test 1

READING PASSAGE 1

Crop-growing skyscrapers

By the year 2050, nearly 80% of the Earth's population will live in **urban** centres. Applying the most **conservative** estimates to **current demographic** trends, the human population will increase by about three billion people by then. An estimated 109 hectares of new land (about 20% larger than Brazil) will be needed to grow enough food to feed them, if traditional farming **methods** continue as they are practised today. At present, throughout the world, over 80% of the land that is suitable for raising crops is in use. Historically, some 15% of that has been laid waste by poor management practices. What can be done to **ensure** enough food for the world's population to live on ?

The **concept** of indoor farming is not new, since **hothouse** production of tomatoes and other produce has been in **vogue** for some time. What is new is the **urgent** need to **scale up** this **technology** to **accommodate** another three billion people. Many believe an entirely new **approach** to indoor farming is **required**, employing **cutting-edge** technologies. One such **proposal** is for the 'Vertical Farm'. The **concept** is of **multi-storey** buildings in which food crops are grown in environmentally controlled conditions. **Situated** in the heart of urban centres, they would **drastically** reduce the amount of transportation required to bring food to consumers. Vertical farms would need to be efficient, cheap to **construct** and safe to operate. If successfully **implemented**, proponents claim, vertical farms offer the promise of urban renewal, **sustainable** production of a safe and varied

Urban= city, inner-city, metropolitan, town...

Conservative= Traditional.

Demographic= relating to the population and groups of people in it.

Vogue= fashion, trend...

Urgent= very important and needing to be dealt with immediately

Current= present, existing...

Scale up= increase, expand, develop...

Accommodate= provide somewhere to stay, house, be big enough for...

Proposal= suggestion, application...

Vertical farming= an idea for a way of farming in which plants are grown or animals are kept in tall structures with many levels.

Multi-storey= many floors.

Situate = locate, position...

Implement= apply, put into practice...

Sustainable= able to continue for a long time.

food supply (through year-round production of all crops), and the **eventual** repair of ecosystems that have been **sacrificed** for horizontal farming.

It took humans 10,000 years to learn how to grow most of the crops we now take for granted. Along the way, we **despoiled** most of the land we worked, often turning **verdant**, natural ecozones into semi-arid deserts. Within that same time frame, we evolved into an urban species, in which 60% of the human population now lives vertically in cities. This means that, for the majority, we humans have **shelter** from the elements, yet we **subject** our food-bearing plants to **the rigours of** the great outdoors and can do no more than hope for a good weather year. However, more often than not now, due to a rapidly changing climate, that is not what happens. Massive floods, long **droughts**, **hurricanes** and severe **monsoons take their toll** each year, destroying millions of tons of valuable crops.

The supporters of vertical farming claim many **potential** advantages for the system. For instance, crops would be produced all year round, as they would be kept in artificially controlled, **optimum** growing conditions. There would be no weather-related crop failures due to droughts, floods or pests. All the food could be grown organically, eliminating the need for **herbicides**, **pesticides** and fertilisers. The system would greatly reduce the **incidence** of many infectious diseases that are acquired at the agricultural **interface**. Although the system would **consume** energy, it would return **energy** to the grid **via** methane **generation** from composting non edible parts of plants. It would also dramatically reduce **fossil** fuel use, by cutting out the need for **tractors**, **ploughs** and shipping.

A **major drawback** of vertical farming, however, is that the plants would **require** **artificial** light. Without it, those plants nearest the windows would be **exposed** to more sunlight and grow more quickly, reducing the efficiency of the system. Single-storey greenhouses have the **benefit** of natural overhead light; even so, many still need artificial lighting. A multi-storey **facility** with no natural overhead light would **require** far more. Generating enough light could

Sacrifice= when you decide not to have something valuable, in order to get something that is more important.

Despoil= damage, spoil, ruin...

Verdant= green.

Shelter= cover, protection...

The rigour of something= the problems and difficulties of a situation.

Drought= a long period of dry weather when there is not enough water for plants and animals to live.

Subject= to force a country or group of people to be ruled by you, and control them very strictly.

Hurricane= cyclone, typhoon, tornado, storm with strong, fast winds...

Monsoon= heavy rain.

Take their toll= to have a very bad effect on something or someone over a long period of time.

Herbicide= a substance used to kill unwanted plants.

Pesticide= a chemical substance used to kill insects and small animals that destroy crops.

Fertilizer= a substance that is put on the soil to make plants grow.

Incidence= occurrence, frequency, rate...

Interface= edge, border, line...

Tractor= a strong vehicle with large wheels, used for pulling farm machinery.

Plough= a piece of farm equipment used to turn over the earth so that seeds can be planted.

Drawback= disadvantage, problem, downside, negative aspect, weakness...

Artificial= synthetic, non-natural, man-made...

Exposed= uncovered, bare...

be prohibitively expensive, unless cheap, renewable **energy** is available, and this appears to be rather a future **aspiration** than a **likelihood** for the near future.

One **variation** on vertical farming that has been developed is to grow plants in stacked trays that move on rails. Moving the trays allows the plants to get enough sunlight. This system is already in operation, and works well within a single-storey greenhouse with light reaching it from above: it is not certain, however, that it can be made to work without that overhead natural light.

Vertical farming is an attempt to **address** the undoubted problems that we face in producing enough food for a growing population. At the moment, though, more needs to be done to reduce the **detrimental impact** it would have on the environment, particularly as regards the use of energy. While it is possible that much of our food will be grown in **skyscrapers** in future, most **experts** currently believe it is far more likely that we will simply use the space **available** on urban rooftops.

Aspiration= ambition, goal, aim, target...

Likelihood= probability, possibility...

Variation = something that is done in a way that is different from the way it is usually done.

Address= tackle, deal with...

Detrimental= harmful, damaging, negative...

Skyscraper= a very tall modern city building.

READING PASSAGE 2

THE FALKIRK WHEEL

A **unique** engineering achievement

The Falkirk Wheel in Scotland is the world's first and only **rotating** boat lift. Opened in 2002, it is **central** to the **ambitious** £84.5m Millennium Link **project** to **restore navigability** across Scotland by reconnecting the historic waterways of the Forth & Clyde and Union Canals.

The **major challenge** of the **project** lays in the fact that the Forth & Clyde Canal is situated 35 metres below

Rotating= turning.

Central= vital, essential, chief, most important, crucial, significant...

Restore= Repair, rebuild...

Navigable= a river, lake etc that is navigable is deep and wide enough for ships to travel on.

the level of the Union Canal. Historically, the two canals had been joined near the town of Falkirk by a sequence of 11 locks - enclosed sections of canal in which the water level could be raised or lowered - that stepped down across a distance of 1.5 km. This had been **dismantled** in 1933, thereby breaking the link. When the project was **launched** in 1994, the British Waterways authority were keen to create a dramatic twenty-first-century landmark which would not only be a fitting commemoration of the Millennium, but also a lasting symbol of the economic regeneration of the region.

Numerous ideas were **submitted** for the project, including concepts ranging from rolling eggs to tilting tanks, from giant **seesaws** to overhead **monorails**. The eventual winner was a plan for the huge rotating steel boat lift which was to become The Falkirk Wheel. The unique shape of the structure is claimed to have been inspired by various sources, both manmade and natural, most notably a Celtic double headed axe, but also the vast turning propeller of a ship, the ribcage of a whale or the spine of a fish.

The various parts of The Falkirk Wheel were all constructed and assembled, like one giant toy building set, at Butterley Engineering's Steelworks in Derbyshire, some 400 km from Falkirk. A team there carefully **assembled** the 1,200 tonnes of steel, painstakingly fitting the pieces together to an accuracy of just 10 mm to ensure a perfect final fit. In the summer of 2001, the structure was then dismantled and transported on 35 **lorries** to Falkirk, before all being bolted back together again on the ground, and finally lifted into position in five large sections by **crane**. The Wheel would need to withstand **immense** and constantly changing stresses as it rotated, so to make the structure more **robust**, the steel sections were bolted rather than welded together. Over 45,000 bolt holes were matched with their bolts, and each bolt was hand-tightened.

The Wheel consists of two sets of opposing axe-shaped arms, **attached** about 25 metres apart to a fixed central spine. Two **diametrically** opposed water-filled 'gondolas', each with a capacity of 360,000 litres,

Dismantle= take to pieces, take apart...

Authority= government department.

Launch= start.

Landmark= attraction, something that is easy to recognize...

Commemoration= remembrance= something that makes you remember and respect someone important or an important event in the past.

Submit= accept, agree to...

Seesaw= a piece of equipment that children play on, made of a board that is balanced in the middle, so that when one end goes up the other goes down.

Monorail= a railway system that uses a single rail, usually high above the ground.

Propeller= a piece of equipment consisting of two or more blades that spin around, which makes an aircraft or ship move.

Assemble= bring together, put together, gather...

Lorry= a large vehicle for carrying heavy goods.

Crane= hoist(a large tall machine used by builders for lifting heavy things).

Withstand= resist, stand up to= to be strong enough to remain unharmed by something such as great heat, cold, pressure etc

Immense= extremely large, enormous...

Attach= to fasten or connect one object to another.

Diametrically= completely.

are fitted between the ends of the arms. These gondolas always weigh the same, whether or not they are carrying boats. This is because, according to Archimedes' principle of displacement, floating objects displace their own weight in water. So when a boat enters a gondola, the amount of water leaving the gondola weighs exactly the same as the boat. This keeps the Wheel balanced and so, despite its enormous mass, it rotates through 180° in five and a half minutes while using very little power. It takes just 1.5 kilowatt-hours (5.4 MJ) of energy to rotate the Wheel -roughly the same as boiling eight small domestic kettles of water.

Boats needing to be lifted up enter the canal **basin** at the level of the Forth & Clyde Canal and then enter the lower **gondola** of the Wheel. Two hydraulic steel gates are raised, so as to **seal** the gondola off from the water in the canal basin. The water between the gates is then pumped out. A hydraulic clamp, which prevents the arms of the Wheel moving while the gondola is docked, is removed, allowing the Wheel to turn. In the central machine room an **array** of ten hydraulic motors then begins to rotate the central axle. The axle connects to the outer arms of the Wheel, which begin to rotate at a speed of 1/8 of a revolution per minute. As the wheel rotates, the gondolas are kept in the upright position by a simple gearing system. Two eight-metre-wide **cogs** orbit a fixed inner cog of the same width, connected by two smaller cogs travelling in the opposite direction to the outer cogs - so ensuring that the gondolas always remain level. When the gondola reaches the top, the boat passes straight onto the aqueduct situated 24 metres above the canal **basin**.

The remaining 11 metres of lift needed to reach the Union Canal is achieved by means of a pair of locks. The Wheel could not be constructed to elevate boats over the full 35-metre difference between the two canals, owing to the presence of the historically important Antonine Wall, which was built by the Romans in the second century AD. Boats travel under this wall via a **tunnel**, then through the locks, and finally on to the Union Canal.

Displace= replace.

Basin= sink.

Gondola= a long narrow boat with a flat bottom and high points at each end, used on the canals in Venice in Italy.

Seal= shut out, close up, stop entering...

Hydraulic= moved or operated by the pressure of water or other liquid.

Robust= strong, tough...

Clamp= a piece of equipment for holding things together.

Array= group.

Cogs= a wheel with small bits sticking out around the edge that fit together with the bits of another wheel as they turn in a machine.

Aqueduct= a structure like a bridge, that carries water across a river or valley.

Elevate= raise, lift, make higher...

Via= through.

Tunnel= a passage that has been dug under the ground for cars, trains etc to go through.

READING PASSAGE 3

Reducing the Effects of Climate Change

Mark Rowe reports on the increasingly ambitious geo-engineering projects being explored by scientists

A

Such is our dependence on fossil fuels, and such is the volume of carbon dioxide already released into the atmosphere, that many experts agree that significant global warming is now inevitable. They believe that the best we can do is keep it at a reasonable level, and at present the only serious option for doing this is cutting back on our carbon emissions. But while a few countries are making major strides in this regard, the majority are having great difficulty even stemming the rate of increase, let alone reversing it. Consequently, an increasing number of scientists are beginning to explore the alternative of geo-engineering — a term which generally refers to the intentional large-scale manipulation of the environment. According to its proponents, geo-engineering is the equivalent of a backup generator: if Plan A - reducing our dependency on fossil fuels - fails, we require a Plan B, employing grand schemes to slow down or reverse the process of global warming.

B

Geo-engineering; has been shown to work, at least on a small localised scale. For decades, MayDay parades in Moscow have taken place under clear blue skies, aircraft having deposited dry ice, silver iodide and cement powder to disperse clouds. Many of the schemes now suggested look to do the opposite, and reduce the amount of sunlight reaching the planet. The most eye-catching idea of all is suggested by Professor Roger Angel of the University of Arizona. His scheme would employ up to 16 trillion minute

Fossil fuel= a fuel such as coal or oil that is produced by the very gradual decaying of animals or plants over millions of years.

Atmosphere= air in environment.

Inevitable= unavoidable, certain...

Emission= release, discharge...

Stride= advance, progress, development, improvement...

Reverse= to change something, such as a decision, judgment, or process so that it is the opposite of what it was before.

Stem= stop.

Manipulation= treatment.

Proponent= advocate, supporter...

Equivalent= counterpart.

Backup= something that you can use to replace something that does not work or is lost.

Grand scheme= impressive plan.

Parade= a public celebration when musical bands, brightly decorated vehicles etc move down the street.

Deposit= place, drop, put down...

Disperse= melt away.

Minute= tiny, little, small...

spacecraft, each weighing about one gram, to form a **transparent**, sunlight-refracting **sunshade** in an orbit 1.5 million km above the Earth. This could, argues Angel, reduce the amount of light reaching the Earth by two per cent.

C

The **majority** of geo-engineering **projects** so far carried out — which include planting forests in deserts and depositing iron in the ocean to **stimulate** the growth of algae - have focused on **achieving** a general cooling of the Earth. But some look specifically at **reversing** the melting at the poles, particularly the Arctic. The reasoning is that if you **replenish** the ice sheets and frozen waters of the high latitudes, more light will be reflected back into space, so reducing the warming of the oceans and atmosphere.

D

The **concept** of **releasing aerosol sprays** into the **stratosphere** above the Arctic has been **proposed** by several scientists. This would **involve** using sulphur or hydrogen sulphide aerosols so that sulphur dioxide would form clouds, which would, in turn, lead to a global **dimming**. The idea is modelled on historic volcanic **explosions**, such as that of Mount Pinatubo in the Philippines in 1991, which led to a short-term cooling of global temperatures by 0.5 °C. Scientists have also **scrutinised** whether it's possible to **preserve** the ice sheets of Greenland with reinforced **high-tension** cables, preventing icebergs from moving into the sea. Meanwhile in the Russian Arctic, geo-engineering plans include the planting of millions of birch trees. Whereas the regions native **evergreen** pines shade the snow an **absorb** radiation, birches would **shed** their leaves in winter, thus **enabling** radiation to be reflected by the snow. **Re-routing** Russian rivers to increase cold water flow to ice-forming **areas** could also be used to slow down warming, say some climate scientists.

E

But will such schemes ever be **implemented**? Generally speaking, those who are most **cautious** about geo-engineering are the scientists involved in the research. Angel says that his plan is 'no **substitute**

Transparent= see-through, clear...

Stimulate= quicken, speed up, promote...

Reverse= to change something, such as a decision, judgment, or process so that it is the opposite of what it was before.

Aerosol= spray can.

Spray= liquid which is forced out of a special container in a stream of very small drops.

Stratosphere= a very high position.

Propose= suggest, recommend...

Dim= dark.

Replenish= refill.

Explosion= bang.

Scrutinise= examine, study, analyze...

Preserve= protect.

High-tension= strong, tight...

Evergreen= an evergreen tree or bush does not lose its leaves in winter.

Shed=lose, get rid of, drop...

Re-routing= change the direction.

Implement= put into practice, apply...

Cautious= careful

Substitute= alternate, replacement...

for developing renewable energy: the only **permanent** solution'. And Dr Phil Rasch of the US-based Pacific Northwest National Laboratory is equally guarded about the **role** of geo-engineering: 'I think all of us agree that if we were to end geo-engineering on a given day, then the planet would return to its pre-engineered condition very rapidly, and probably within ten to twenty years. That's certainly something to worry about.'

F

The US National Center for Atmospheric Research has already suggested that the proposal to **inject** sulphur into the atmosphere might **affect** rainfall patterns across **the tropics** and the Southern Ocean. 'Geo-engineering plans to inject stratospheric aerosols or to seed clouds would act to cool the planet, and act to increase the extent of sea ice,' says Rasch. 'But all the models suggest some **impact** on the **distribution** of **precipitation**.'

G

A further risk with geo-engineering **projects** is that you can "**overshoot**" says Dr Dan Hunt, from the University of Bristol's School of Geophysical Sciences, who has studied the likely **impacts** of the **sunshade** and **aerosol** schemes on the climate. 'You may bring global temperatures back to pre-industrial levels, but the risk is that the **poles** will still be warmer than they should be and the tropics will be cooler than before industrialisation.' To avoid such a **scenario**," Hunt says, "Angel's **project** would have to operate at half strength; all of which **reinforces** his view that the best **option** is to avoid the need for geo-engineering altogether."

H

The main reason why geo-engineering is supported by many in the scientific **community** is that most researchers have little **faith** in the ability of politicians to agree - and then bring in — the necessary carbon cuts. Even leading **conservation** organisations see the value of investigating the **potential** of geo-engineering. According to Dr Martin Sommerkorn, climate change advisor for the World Wildlife Fund's International Arctic Programme, 'Human-induced

Permanent= everlasting, eternal, enduring...

Inject= insert, add, bring in...

The tropics= the hottest part of the world, which is around the equator,

Distribution= spreading, allocation...

Precipitation= rainfall.

Overshoot= miss.

Pole= the most northern or most southern point on a planet, especially the Earth.

Scenario= situation.

Reinforce= strengthen, support...

Faith= belief.

Conservation= Preservation, protection....

climate change has brought humanity to a position where we shouldn't **exclude** thinking thoroughly about this **topic** and its possibilities.'

Test 2

READING PASSAGE 1

Raising the Mary Rose

How a sixteenth-century warship was recovered from the seabed

On 19 July 1545, English and French **fleets** were **engaged in** a sea battle off the coast of southern England in the **area** of water called the Solent, between Portsmouth and the Isle of Wight. Among the English **vessels** was a warship by the name of Mary Rose. Built in Portsmouth some 35 years earlier, she had had a long and successful fighting career, and was a favourite of King Henry VIII. Accounts of what happened to the ship vary: while **witnesses** agree that she was not hit by the French, some **maintain** that she was **outdated**, **overladen** and sailing too low in the water, others that she was **mishandled** by undisciplined crew. What is **undisputed**, however, is that the Mary Rose sank into the Solent that day, taking at least 500 men with her. After the battle, attempts were made to **recover** the ship, but these failed.

The Mary Rose came to rest on the seabed, lying on her **starboard** (right) side at an angle of approximately 60 degrees. The **hull** (the body of the ship) acted as a trap for the sand and mud carried by Solent currents. As a result, the **starboard** side filled rapidly, leaving the exposed port (left) side to be **eroded** by marine organisms and mechanical **degradation**. Because of the way the ship sank, nearly all of the **starboard** half survived **intact**. During the seventeenth and eighteenth centuries, the entire **site** became covered with a **layer** of hard grey clay, which minimised further **erosion**.

Exclude= stop, reject.

Fleet= ship in a navy.

Engaged in= to be doing or to become involved in an activity.

Vessel= a ship or large boat.

Witness= observer.

Outdated=out-of-date, outmoded...

Overladen= filled with too many people or things.

Mishandle= to treat something roughly, often causing damage.

Undisputed= acknowledged, undeniable...

Erode= to gradually reduce something such as someone's power or confidence.

Degradation= the process by which something changes to a worse condition.

Intact= unbroken, unharmed, undamaged...

Erosion=wearing away.

Then, on 16 June 1836, some fishermen in the Solent **found** that their equipment was caught on an underwater **obstruction**, which turned out to be the Mary Rose. Diver John Deane happened to be exploring another **sunken** ship nearby, and the fishermen approached him, asking him to free their **gear**. Deane dived down, and **found** the equipment caught on a **timber protruding** slightly from the seabed. Exploring further, he uncovered several other timbers and a bronze gun. Deane continued diving on the **site intermittently** until 1840, recovering several more guns, two bows, various timbers, part of a **pump** and various other small finds.

The Mary Rose then **faded into obscurity** for another hundred years. But in 1965, **military** historian and **amateur** diver Alexander McKee, in **conjunction** with the British Sub-Aqua Club, **initiated** a **project** called 'Solent Ships'. While on paper this was a plan to examine a number of known **wrecks** in the Solent, what McKee really hoped for was to find the Mary Rose. Ordinary search **techniques** proved unsatisfactory, so McKee entered into **collaboration** with Harold E. Edgerton, professor of electrical engineering at the Massachusetts Institute of Technology. In 1967, Edgerton's side-scan **sonar** systems **revealed** a large, unusually shaped object, which McKee believed was the Mary Rose.

Further **excavations** **revealed** stray pieces of timber and an iron gun. But the **climax** to the operation came when, on 5 May 1971, part of the ship's **frame** was uncovered. McKee and his **team** now knew for certain that they had **found** the wreck, but were as yet **unaware** that it also housed a **treasure trove** of beautifully preserved artefacts. Interest in the **project** grew, and in 1979, The Mary Rose Trust was formed, with Prince Charles as its President and Dr Margaret Rule its Archaeological Director. The decision whether or not to **salvage** the wreck was not an easy one, although an excavation in 1978 had shown that it might be possible to raise the hull. While the original aim was to raise the **hull** if at all **feasible**, the operation was not given the go-ahead until January 1982, when all the necessary information was available.

Obstruction= blockage, obstacle...

Gear= a set of equipment or tools you need for a particular activity.

Timber= wood.

Protrude= Stick out.

Intermittently= from time to time.

Fade into obscurity= the state of not being known or remembered.

Amateur= not professional.

Conjunction=combination.

Initiate= start, set off...

Wreck= ruin.

Collaboration= teamwork, partnership...

Sonar= relating to sun.

Excavation=digging.

Climax= peak, highpoint, best moment...

Frame= structure.

Treasure trove= a group of valuable or interesting things or pieces of information, or the place where they are.

Treasure= valuable.

Feasible= possible, practicable, workable...

An important **factor** in trying to **salvage** the Mary Rose was that the remaining **hull** was an open shell. This led to an important decision being taken: namely to carry out the lifting operation in three very **distinct** stages. The **hull** was **attached** to a lifting frame **via** a **network** of bolts and lifting wires. The problem of the **hull** being sucked back downwards into the mud was **overcome** by using 12 **hydraulic** jacks. These raised it a few centimetres over a **period** of several days, as the lifting frame rose slowly up its four legs. It was only when the **hull** was hanging freely from the lifting frame, clear of the seabed and the suction effect of the surrounding mud, that the **salvage** operation progressed to the second stage. In this stage, the lifting frame was fixed to a **hook** attached to a **crane**, and the **hull** was lifted completely clear of the seabed and transferred underwater into the lifting cradle. This required **precise** positioning to **locate** the legs into the **stabbing** guides' of the lifting cradle. The lifting **cradle** was designed to fit the **hull** using archaeological **survey** drawings, and was fitted with air bags to provide additional **cushioning** for the hull's delicate timber **framework**. The third and **final** stage was to lift the entire **structure** into the air, by which time the **hull** was also supported from below. Finally, on 11 October 1982, millions of people around the world held their breath as the timber **skeleton** of the Mary Rose was lifted clear of the water, ready to be returned home to Portsmouth.

Attach=glue, join, connect...

Via= through.

Overcome= defeat.

Salvage= recover, save.

Hook= a curved piece of metal or plastic that you use for hanging things on.

Crane= a large tall machine used by builders for lifting heavy things.

Precise= exact, specific, accurate...

Framework= the main supporting parts of a building, vehicle, or object.

Skeleton= the main structure that supports a building, bridge etc.

READING PASSAGE 2

What destroyed the civilisation of Easter Island?

A
Easter Island, or Rapu Nui as it is known locally, is home to several hundred **ancient** human statues - the moai. After this **remote** Pacific island was **settled** by

Ancient=very old.

Remote= distant, far-off...

Settled= established.

the Polynesians, it remained **isolated** for centuries. All the **energy** and resources that went into the moai - some of which are ten metres tall and weigh over 7,000 kilos - came from the island itself. Yet when Dutch explorers landed in 1722, they met a Stone Age culture. The moai were **carved** with stone tools, then transported for many kilometres, without the use of animals or wheels, to massive stone **platforms**. The identity of the moai builders was in doubt until well into the twentieth century. Thor Heyerdahl, the Norwegian ethnographer and adventurer, thought the statues had been created by pre-Inca peoples from Peru. Bestselling Swiss **author** Erich von Daniken believed they were built by **stranded extraterrestrials**. Modern science - linguistic, **archaeological** and **genetic** evidence - has **definitively** proved the moai builders were Polynesians, but not how they moved their creations. Local **folklore** maintains that the statues walked, while researchers have tended to **assume** the ancestors **dragged** the statues somehow, using **ropes** and **logs**.

B

When the Europeans arrived, Rapa Nui was grassland, with only a few scrawny trees. In the 1970s and 1980s, though, researchers **found pollen** preserved in lake **sediments**, which proved the island had been covered in lush palm forests for thousands of years. Only after the Polynesians arrived did those forests disappear. US scientist Jared Diamond believes that the Rapanui people - **descendants** of Polynesian settlers - wrecked their own environment. They had unfortunately settled on an extremely **fragile** island - dry, cool, and too remote to be properly fertilised by windblown volcanic **ash**. When the islanders cleared the forests for firewood and farming, the forests didn't grow back. As trees became scarce and they could no longer **construct** wooden canoes for fishing, they ate birds. Soil **erosion** decreased their crop yields. Before Europeans arrived, the Rapanui had **descended** into **civil** war and cannibalism, he maintains. The **collapse** of their isolated civilisation, Diamond writes, is a 'worst-case **scenario** for what may lie ahead of us in our own future'.

C

Isolated= remote.

Carved= imprinted.

Platform= stage.

Stranded= stuck.

Extraterrestrial= a creature that people think may exist on another planet.

Archaeological= the study of ancient societies by examining what remains of their buildings, graves, tools etc.

Genetic= relating to genes or genetics.

Definitively= perfectly.

Folklore= myths, legends...

Drag= pull.

Rope= very strong thick string, made by twisting together many thinner strings.

Log= a thick piece of wood from a tree.

Pollen= a fine powder produced by flowers, which is carried by the wind or by insects to other flowers of the same type, making them produce seeds.

Sediment= solid substances that settle at the bottom of a liquid.

Descendant= offspring, previous generation...

Fragile= easily broken.

Ash= the soft grey powder that remains after something has been burned.

Erosion= wearing away.

Descend= fall.

Scenario= situation.

The moai, he thinks, **accelerated** the self-destruction. Diamond interprets them as power **displays** by **rival** chieftains who, trapped on a remote little island, lacked other ways of **asserting** their dominance. They competed by building ever bigger figures. Diamond thinks they laid the moai on wooden sledges, hauled over log rails, but that required both a lot of wood and a lot of people. To feed the people, even more land had to be cleared. When the wood was gone and **civil** war began, the islanders began **toppling** the moai. By the nineteenth century none were standing.

D

Archaeologists Terry Hunt of the University of Hawaii and Carl Lipo of California State University agree that Easter Island lost its lush forests and that it was an 'ecological **catastrophe**' - but they believe the islanders themselves weren't to blame. And the moai certainly weren't. Archaeological excavations **indicate** that the Rapanui went to heroic efforts to protect the resources of their wind-lashed, **infertile** fields. They built thousands of circular stone windbreaks and gardened inside them, and used broken volcanic rocks to keep the soil **moist**. In short, Hunt and Lipo argue, the prehistoric Rapanui were **pioneers** of **sustainable** farming.

E

Hunt and Lipo **contend** that moai-building was an activity that helped keep the peace between islanders. They also believe that moving the moai required few people and no wood, because they were walked upright. On that issue, Hunt and Lipo say, archaeological evidence backs up Rapanui folklore. Recent experiments **indicate** that as few as 18 people could, with three strong ropes and a bit of practice, easily **manoeuvre** a 1,000 kg moai replica a few hundred metres. The figures' fat bellies tilted them forward, and a D-shaped base allowed handlers to roll and rock them side to side.

F

Moreover, Hunt and Lipo are **convinced** that the settlers were not wholly responsible for the loss of the island's trees. Archaeological finds of **nuts** from the extinct Easter Island palm show tiny **grooves**, made

Accelerate= quicken, speed up...

Rival= opponent.

Assert= defend, maintain...

Topple= to take power away from a leader or government, especially by force.

Catastrophe= disaster.

Infertile= unproductive.

Moist= wet, damp...

Pioneer= leader.

Sustainable= able to continue for a long time.

Contend= argue.

Manoeuvre= move, turn.

Convince= persuade.

Nut= seed.

Groove= a thin line cut into a hard surface.

by the teeth of Polynesian rats. The rats arrived along with the settlers, and in just a few years, Hunt and Lipo calculate, they would have **overrun** the island. They would have prevented the reseeding of the slow-growing palm trees and **thereby doomed** Rapa Nui's forest, even without the settlers' campaign of **deforestation**. No doubt the rats ate birds' eggs too. Hunt and Lipo also see no evidence that Rapanui civilisation **collapsed** when the palm forest did. They think its population grew rapidly and then remained more or less **stable** until the arrival of the Europeans, who introduced deadly diseases to which islanders had no **immunity**. Then in the nineteenth century **slave** traders **decimated** the population, which shrivelled to 111 people by 1877.

G

Hunt and Lipo's vision, therefore, is one of an island populated by peaceful and **ingenious** moai builders and careful stewards of the land, rather than by **reckless** destroyers ruining their own **environment** and society. 'Rather than a case of **abject failure**, Rapa Nui is an unlikely story of success', they claim. Whichever is the case, there are surely some valuable lessons which the world at large can learn from the story of Rapa Nui.

Overrun= if a place is overrun by unwanted things or people, they spread over it in great numbers.

Doom= ruin, destroy...

Deforestation= the cutting or burning down of all the trees in an area.

Collapse= fall down.

Immunity= resistance, protection...

Slave= someone who is owned by another person and works for them for no money.

Decimate= destroy, devastate, ruin...

Ingenious= clever., good at inventing...

Reckless= careless.

Abject failure= the state of being extremely poor, unhappy, unsuccessful etc.

READING PASSAGE 3

Neuroaesthetics

An **emerging discipline** called neuroaesthetics is seeking to bring scientific **objectivity** to the study of art, and has already given us a better understanding of many **masterpieces**. The **blurred** imagery of Impressionist paintings seems to **stimulate** the brain's amygdala, for instance. Since the **amygdala** plays a

Emerge= rising.

Objectivity= aim, goal, target, purpose...

Masterpieces= a work of art, a piece of writing or music etc that is of very high quality or that is the best that a particular artist, writer etc has produced.

Blurred= unclear.

Stimulate= quicken, accelerate...

crucial role in our feelings, that finding might explain why many people find these pieces so **moving**.

Could the same **approach** also **shed light on abstract** twentieth-century pieces, from Mondrian's geometrical blocks of colour, to Pollock's seemingly **haphazard** arrangements of splashed paint on canvas? **Sceptics** believe that people claim to like such works simply because they are famous. We certainly do have an **inclination** to follow the crowd. When asked to make simple perceptual decisions such as matching a shape to its rotated image, for example, people often choose a **definitively** wrong answer if they see others doing the same. It is easy to imagine that this **mentality** would have even more **impact** on a **fuzzy concept** like art **appreciation**, where there is no right or wrong answer.

Angelina Hawley-Dolan, of Boston College, Massachusetts, responded to this **debate** by asking **volunteers** to view pairs of paintings - either the creations of famous **abstract** artists or the **doodles** of infants, **chimps** and elephants. They then had to judge which they preferred. A third of the paintings were given no **captions**, while many were labelled incorrectly - volunteers might think they were viewing a chimp's messy brushstrokes when they were actually seeing an acclaimed masterpiece. In each set of trials, **volunteers** generally preferred the work of **renowned** artists, even when they believed it was by an animal or a child. It seems that the viewer can sense the artist's **vision** in paintings, even if they can't explain why.

Robert Pepperell, an artist based at Cardiff University, creates **ambiguous** works that are neither entirely **abstract** nor clearly representational. In one study, Pepperell and his **collaborators** asked **volunteers** to decide how 'powerful' they considered an artwork to be, and whether they saw anything familiar in the piece. The longer they took to answer these questions, the more highly they rated the piece under **scrutiny**, and the greater their neural activity. It would seem that the brain sees these **images** as puzzles, and the harder it is to **decipher** the meaning, the more rewarding is the moment of recognition.

Crucial= vital, central, essential, important...

Moving= touching, affecting...

Shed light on = Make clear, explain, simplify...

Abstract= nonfigurative.

Sceptic= a person who disagrees with particular claims and statements, especially those that are generally thought to be true.

Inclination= a feeling that makes you want to do something.

Mentality= state of mind, way of thinking, mindset...

Fuzzy=uncertain.

Doodle= drawing.

Chimp= an intelligent African animal that is like a large monkey without a tail.

Caption= title, description...

Renowned= famous, well-known...

Ambiguous= uncertain, confusing, unclear...

Collaborator= coworkers colleague, partner...

Scrutiny= examination, analysis...

Decipher= decode, interpret...

And what about artists such as Mondrian, whose paintings consist exclusively of horizontal and vertical lines encasing blocks of colour? Mondrian's works are **deceptively** simple, but eye-tracking studies confirm that they are **meticulously** composed, and that simply rotating a piece radically changes the way we view it. With the originals, volunteers' eyes tended to stay longer on certain places in the image, but with the altered versions they would **flit** across a piece more rapidly. As a result, the volunteers considered the altered versions less pleasurable when they later rated the work.

In a similar study, Oshin Vartanian of Toronto University asked volunteers to compare original paintings with ones which he had altered by moving objects around within the **frame**. He found that almost everyone preferred the original, whether it was a Van Gogh still life or an abstract by Miro. Vartanian also found that changing the composition of the paintings reduced activation in those brain areas linked with meaning and **interpretation**.

In another experiment, Alex Forsythe of the University of Liverpool analysed the visual intricacy of different pieces of art, and her results suggest that many artists use a key level of detail to please the brain. Too little and the work is boring, but too much results in a kind of 'perceptual overload', according to Forsythe. What's more, **appealing** pieces both abstract and representational, show signs of 'fractals' - repeated **motifs** recurring in different scales, fractals are common throughout nature, for example in the shapes of mountain peaks or the branches of trees. It is possible that our visual system, which evolved in the great outdoors, finds it easier to process such patterns.

It is also intriguing that the brain appears to process movement when we see a handwritten letter, as if we are replaying the writer's moment of creation. This has led some to **wonder** whether Pollock's works feel so **dynamic** because the brain reconstructs the energetic actions the artist used as he painted. This may be down to our brain's 'mirror neurons', which are known to **mimic** others' actions. The hypothesis will need to be thoroughly tested, however. It might even be the

Deceptive= something that is deceptive seems to be one thing but is in fact very different.

Meticulously= carefully, exactly...

Altered= changed.

Flit= to move lightly or quickly and not stay in one place for very long.

Frame= the main ideas, facts etc that something is based on.

Interpretation= explanation or understanding...

Intricacy= complexity.

Appealing= attractive, interesting...

Motif= pattern.

Intriguing= fascinating, interesting, exciting...

Wonder= doubt, question, self-ask...

Dynamic= lively, energetic...

Mimic= copy, imitate...

case that we could use neuroaesthetic studies to understand the **longevity** of some pieces of artwork. While the fashions of the time might shape what is currently popular, works that are best adapted to our visual system may be the most likely to **linger** once the trends of previous generations have been forgotten.

It's still early days for the field of neuroaesthetics - and these studies are probably only a taste of what is to come. It would, however, be **foolish** to reduce art **appreciation** to a set of scientific laws. We shouldn't **underestimate** the importance of the style of a particular artist, their place in history and the artistic environment of their time. Abstract art offers both a challenge and the freedom to play with different interpretations. In some ways, it's not so different to science, where we are constantly looking for systems and **decoding** meaning so that we can view and appreciate the world in a new way.

Longevity= long life.

Linger= remain.

Foolish= stupid, silly, unwise...

Appreciation= admiration, enjoyment...

Underestimate= undervalue.

Decode= decipher, interpret...

Test 3 READING PASSAGE 1

THE STORY OF SILK

The history of the world's most **luxurious fabric**, from **ancient** China to the present day

Silk is a **fine**, **smooth** material produced from the cocoons - soft protective shells - that are made by mulberry silkworms (insect larvae). **Legend** has it that it was Lei Tzu, wife of the Yellow Emperor, ruler of China in about 3000 BC, who discovered silkworms. One account of the story goes that as she was taking a walk in her husband's gardens, she discovered that silkworms were **responsible** for the **destruction** of several mulberry trees. She collected a number of cocoons and sat down to **have a rest**. It just so happened that while she was sipping some tea, one of

Luxurious= very expensive, beautiful, and comfortable.

Fabric= material.

Ancient= very old.

Fine= well, excellent, top quality...

Smooth= downy, soft, flat...

Legend= myth, fairy tale...

Responsible= to blame.

Destruction= ruin, damage...

Have a rest= relax, have a break...

the cocoons that she had collected landed in the hot tea and started to **unravel** into a fine **thread**. Lei Tzu **found** that she could wind this thread around her fingers. Subsequently, she **persuaded** her husband to allow her to **rear** silkworms on a grove of mulberry trees. She also **devised** a special reel to draw the **fibres** from the cocoon into a single thread so that they would be strong enough to be woven into fabric. While it is unknown just how much of this is true, it is certainly known that silk **cultivation** has existed in China for several millennia.

Originally, silkworm farming was **solely** restricted to women, and it was they who were responsible for the growing, harvesting and weaving. Silk quickly grew into a **symbol** of status, and originally, only royalty were **entitled** to have clothes made of silk. The rules were gradually relaxed over the years until finally during the Qing Dynasty (1644—1911 AD), even **peasants**, the lowest caste, were also entitled to wear silk. Sometime during the Han Dynasty (206 BC-220 AD), silk was so prized that it was also used as a unit of **currency**. Government officials were paid their salary in silk, and farmers paid their taxes in grain and silk. Silk was also used as **diplomatic** gifts by the **emperor**. Fishing lines, bowstrings, musical instruments and paper were all made using silk. The earliest indication of silk paper being used was discovered in the **tomb** of a **noble** who is estimated to have died around 168 AD.

Demand for this **exotic** fabric **eventually** created the **lucrative** trade **route** now known as the Silk Road, taking silk westward and bringing gold, silver and wool to the East. It was named the Silk Road after its most precious **commodity**, which was considered to be worth more than gold. The Silk Road stretched over 6,000 kilometres from Eastern China to the Mediterranean Sea, following the Great Wall of China, climbing the Pamir mountain range, crossing modern-day Afghanistan and going on to the Middle East, with a **major** trading market in Damascus. From there, the **merchandise** was shipped across the Mediterranean Sea. Few merchants travelled the entire route; goods were handled mostly by a **series** of **middlemen**.

Unravel= untie, loosen...

Thread= a long thin string of cotton, silk etc used to sew or weave cloth.

Persuade= convince.

Rear= raise, nurture...

Devise= invent, plan, formulate...

Fibre= a mass of threads used to make rope, cloth etc.

Cultivation= farming, crop growing...

Entitled= allowed, permitted...

Peasant= poor farmer.

Currency= money.

Diplomatic= political, ambassadorial...

Emperor= royal leader, monarch...

Tomb= burial place for last resting place...

Noble= a member of the highest social class with a title such as 'Duke' or 'Countess'.

Exotic= foreign.

Lucrative= profitable, beneficial...

Precious= valuable, important...

Commodity= product.

Merchandise= goods, products...

Middlemen= someone who buys things in order to sell them to someone else, or who helps to arrange business deals for other people.

With the mulberry silkworm being native to China, the country was the world's **sole** producer of silk for many hundreds of years. The secret of silk-making **eventually** reached the rest of the world **via** the Byzantine Empire, which ruled over the Mediterranean **region** of southern Europe, North Africa and the Middle East during the **period** 330—1453 AD. According to another legend, monks working for the Byzantine emperor Justinian smuggle silkworm eggs to Constantinople (Istanbul in modern-day Turkey) in 550 AD, **concealed** inside **hollow** bamboo walking canes. The Byzantines were as **secretive** as the Chinese, however, and for many centuries the **weaving** and trading of silk fabric was a strict **imperial monopoly**. Then in the seventh century, the Arabs **conquered** Persia, **capturing** their **magnificent** silks in the process. Silk production thus spread through Africa, Sicily and Spain as the Arabs swept, through these lands. Andalusia in southern Spain was Europe's main silk-producing centre in the tenth century. By the thirteenth century, however, Italy had become Europe's leader in silk production and **export**. Venetian merchants traded extensively in silk and encouraged silk growers to settle in Italy. Even now, silk processed in the province of Como in northern Italy enjoys an **esteemed reputation**.

The nineteenth century and industrialisation saw the downfall of the European silk industry. Cheaper Japanese silk, trade in which was greatly **facilitated** by the opening of the Suez Canal, was one of the many **factors** driving the trend. Then in the twentieth century, new manmade fibres, such as nylon, started to be used in what had traditionally been silk products, such as stockings and parachutes. The two world wars, which **interrupted** the supply of **raw** material from Japan, also stifled the European silk industry. After the Second World War, Japan's silk production was **restored**, with improved production and quality of raw silk. Japan was to remain the world's biggest producer of raw silk, and practically the only **major** exporter of raw silk, until the 1970s. However, in more recent decades, China has gradually **recaptured** its position as the world's biggest producer and exporter of raw silk and silk yarn. Today, around 125,000 metric tons of silk are produced in the world, and almost two

Eventually= finally, in the end...

Concealed= hidden, covered...

Secretive= a secretive person or organization likes to keep their thoughts, intentions, or actions hidden from others.

Weave= to make cloth, a carpet, a basket etc by crossing threads or thin pieces under and over each other by hand or on a loom.

Imperial= relating to an empire or to the person who rules it.

Monopoly= if a company or government has a monopoly of a business or political activity, it has complete control of it so that other organizations cannot compete with it.

Conquer= defeat, beat, overpower...

Capture= take over, take...

Magnificent= very good or beautiful, and very impressive.

Export= sell abroad, sell overseas, sell to other countries...

Esteemed= respected, admired, honored...

Reputation= standing.

Facilitate= aid, make easy, make possible...

Interrupt= stop.

Raw= unprocessed, unrefined...

Recapture= bring back, take over again...

thirds of that production takes place in China.

READING PASSAGE 2

Great Migrations

Animal **migration**, however it is **defined**, is far more than just the movement of animals. It can **loosely** be described as travel that **takes place at regular intervals** - often in an **annual cycle** - that may **involve** many members of a species, and is rewarded only after a long journey. It suggests **inherited instinct**. The biologist Hugh Dingle has **identified** five characteristics that apply, in **varying** degrees and combinations, to all migrations. They are **prolonged** movements that carry animals outside familiar habitats; they tend to be linear, not zigzaggy; they **involve** special behaviours concerning preparation (such as overfeeding) and arrival; they demand special **allocations** of energy. And one more: migrating animals **maintain** an **intense** attentiveness to the greater **mission**, which keeps them **undistracted** by **temptations** and **undeterred** by challenges that would turn other animals aside.

An arctic tern, on its 20,000 km flight from the extreme south of South America to the Arctic circle, will take no notice of a nice smelly **herring** offered from a bird-watcher's boat along the way. While local gulls will **dive** voraciously for such handouts, the tern flies on. Why? The arctic tern **resists** distraction because it is driven at that moment by an instinctive sense of something we humans find admirable: larger purpose. In other words, it is determined to reach its destination. The bird senses that it can eat, rest and mate later. Right now it is totally focused on the journey; its undivided **intent** is arrival. Reaching some gravelly coastline in the Arctic, upon which other arctic terns have **converged**, will serve its larger purpose as shaped by **evolution**: finding a place, a time, and a set

Migration= relocation, resettlement, movement...

Define= describe correctly and thoroughly...

Loosely= In a way that is not strictly controlled and organized.

Take place= happen, occur...

At regular intervals= often.

Inherited= inborn, innate...

Instinct= nature, character...

Identify= discover, detect, find...

Prolonged= expanded, lengthened...

Allocation= distribution.

Mission= duty, job, work...

Undistracted = able to concentrate fully on something...

Temptation= attraction, lure...

Undeterred= if you are undeterred by something, you do not allow it to stop you doing what you want.

Herring = a long thin silver sea fish that can be eaten.

Dive= go underwater.

Resist= refuse to accept, defend against...

Intent= intention, aim, goal, target, purpose...

Converge= meet.

Evolution= growth, development...

of **circumstances** in which it can successfully **hatch** and **rear offspring**.

But migration is a **complex** issue, and biologists **define** it differently, depending in part on what sorts of animals they study. Joe! Berger, of the University of Montana, who works on the American pronghorn and other large terrestrial mammals, prefers what he calls a simple, practical definition suited to his **beasts**: 'movements from a seasonal home **area** away to another home **area** and back again'. Generally the reason for such seasonal back-and-forth movement is to **seek** resources that aren't **available** within a single **area** year-round.

But daily **vertical** movements by zooplankton in the ocean - upward by night to **seek** food, downward by day to escape **predators** - can also be considered migration. So can the movement of aphids when, having **depleted** the young leaves on one food plant, their offspring then fly onward to a different host plant, with no one aphid ever returning to where it started.

Dingle is an evolutionary biologist who studies insects. His definition is more **intricate** than Berger's, **citing** those five features that **distinguish** migration from other forms of movement. They allow for the fact that, for example, aphids will become **sensitive to** blue light (from the sky) when it's time for takeoff on their big journey, and sensitive to yellow light (reflected from tender young leaves) when it's **appropriate** to land. Birds will fatten themselves with heavy feeding in advance of a long migrational flight. The value of his **definition**, Dingle argues, is that it focuses attention on what the **phenomenon** of wildebeest migration shares with the **phenomenon** of the aphids, and therefore helps guide researchers towards understanding how evolution has produced them all.

Human behaviour, however, is having a **detrimental impact** on animal migration. The pronghorn, which **resembles** an antelope, though they are unrelated, is the fastest land mammal of the New World. One population, which spends the summer in the mountainous Grand Teton National Park of the western USA, follows a narrow **route** from its summer

Hatch= if a young bird, insect etc hatches, or if it is hatched, it comes out of its egg.

Rear= look after, raise...

Offspring= children.

Beast= creature, animal...

Vertical= straight up= pointing up in a line that forms an angle of 90° with a flat surface.

Predator= an animal that kills and eats other animals(preys).

Deplete= reduce, eat up, lesson, exhaust...

Intricate = complicated, complex...

Cite= name, mention, refer to...

Distinguish= differentiate, discriminate...

Sensitive to= responsive to.

Appropriate= suitable, proper, fitting...

Detrimental= harmful, negative, damaging...

Resemble= look like, be similar to...

range in the mountains, across a river, and down onto the plains. Here they wait out the frozen months, feeding mainly on sagebrush blown clear of snow. These pronghorn are **notable** for the invariance of their migration **route** and the **severity** of its **constriction** at three **bottlenecks**. If they can't pass through each of the three during their spring migration, they can't reach their bounty of summer grazing; if they can't pass through again in autumn, escaping south onto those windblown **plains**, they are likely to die trying to overwinter in the deep snow. Pronghorn, dependent on distance **vision** and speed to keep safe from predators, **traverse** high, open shoulders of land, where they can see and run. At one of the bottlenecks, forested hills rise to form a V, leaving a **corridor** of open ground only about 150 metres wide, filled with private homes. Increasing development is leading toward a **crisis** for the pronghorn, **threatening** to **choke off** their passageway.

Conservation scientists, along with some biologists and land managers within the USA's National Park Service and other **agencies**, are now working to **preserve** migrational behaviours, not just species and habitats. A National Forest has recognised the **path** of the pronghorn, much of which passes across its land, as a protected migration corridor. But neither the Forest Service nor the Park Service can control what happens on private land at a bottleneck. And with certain other migrating species, the **challenge** is complicated further - by vastly greater distances traversed, more **jurisdictions**, more borders, more dangers along the way. We will **require** **wisdom** and **resoluteness** to **ensure** that migrating species can continue their journeying a while longer.

Notable= distinguished, famous, outstanding...

Severity= seriousness, awfulness, dangerousness...

Constriction= restriction, limitation...

Bottleneck= a delay in one stage of a process that makes the whole process slower and more difficult.

Plain= a large area of flat dry land.

Traverse= cross, pass through, go over...

Corridor= long, narrow passage, passage way...

Crisis= disaster.

Threaten= endanger, jeopardize...

Choke off= to prevent something from happening.

Conservation= protection, maintenance...

Agency= group, organization...

Preserve= maintain, protect...

Path= way, route...

Jurisdiction= influence, power, right...

Wisdom= understanding, intelligence, knowledge...

Resoluteness= firmness, determination...

READING PASSAGE 3

Preface to 'How the other half thinks: Adventures in mathematical reasoning'

A

Occasionally, in some difficult musical **compositions**, there are beautiful, but easy parts - parts so simple a beginner could play them. So it is with mathematics as well. There are some discoveries in **advanced** mathematics that do not depend on **specialized** knowledge, not even on algebra, geometry, or trigonometry. Instead they may involve, at most, a little arithmetic, such as 'the sum of two **odd numbers** is **even**', and common sense. Each of the eight chapters in this book **illustrates** this phenomenon. Anyone can understand every step in the reasoning. The thinking in each chapter uses at most only **elementary** arithmetic, and sometimes not even that. Thus all readers will have the chance to **participate in** a mathematical experience, to **appreciate** the beauty of mathematics, and to become familiar with its logical, yet **intuitive**, style of thinking.

B

One of my purposes in writing this book is to give readers who haven't had the opportunity to see and enjoy real mathematics the chance to appreciate the mathematical way of thinking. I want to **reveal** not only some of the **fascinating** discoveries, but, more importantly, the reasoning behind them. In that respect, this book differs from most books on mathematics written for the general public. Some present the lives of colorful mathematicians. Others describe important applications of mathematics. Yet others go into mathematical **procedures**, but **assume** that the reader is **adept** in using algebra.

Occasionally= infrequently, irregularly, rarely...

Composition= work of art, piece of music...

Advanced= higher.

Specialized= particular, focused, specific, expert...

Odd number><even number= a number that cannot be divided exactly by two, for example 1,3, 5,7 etc.

Illustrate= demonstrate, show, describe...

Elementary= basic, simple, straightforward, uncomplicated...

Participate in= take part in.

Appreciate= be grateful for, value...

Intuitive= instinctive.

Reveal= bring to light, show...

Fascinating= charming, interesting, attractive...

Procedure= process, method, practice...

Assume= presume, suppose, guess...

Adept= skillful, expert, proficient...

C

I hope this book will help **bridge** that **notorious gap** that separates the two cultures: the humanities and the sciences, or should I say the right brain (intuitive) and the left brain (analytical, numerical). As the chapters will illustrate, mathematics is not restricted to the analytical and numerical; **intuition** plays a significant role. The alleged gap can be narrowed or completely **overcome** by anyone, in part because each of us is far from using the full **capacity** of either side of the brain. To illustrate our human potential, I **cite** a structural engineer who is an artist, an electrical engineer who is an opera singer, an opera singer who published mathematical research, and a mathematician who publishes short stories.

D

Other scientists have written books to explain their fields to non-scientists, but have necessarily had to **omit** the mathematics, although it provides the **foundation** of their theories. The reader must remain a **tantalized spectator** rather than an involved participant, since the appropriate language for describing the details in much of science is mathematics, whether the subject is expanding universe, subatomic particles, or chromosomes. Though the broad outline of a scientific theory can be **sketched** intuitively, when a part of the physical universe is finally understood, its description often looks like a page in a mathematics text.

E

Still, the non-mathematical reader can go far in understanding mathematical reasoning. This book presents the details that illustrate the mathematical style of thinking, which involves sustained, step-by-step **analysis**, **experiments**, and insights. You will turn these pages much more slowly than when reading a novel or a newspaper. It may help to have a pencil and paper ready to check **claims** and **carry out** experiments.

F

As I wrote, I kept in mind two types of readers: those who enjoyed mathematics until they were turned off by

Bridge= link, connect...

Notorious= infamous.

Gap= space.

Intuition= the ability to understand or know something because of a feeling rather than by considering the facts.

Overcome= conquer, defeat...

Capacity= ability.

Cite= name, mention, refer to...

Omit= neglect, ignore, forget...

Foundation= base, basis...

Tantalized= excited.

Spectator= viewer, watcher, observer...

Sketch= draft, outline...

Analysis= study, investigation, examination...

Experiment= test.

Claim= request, demand...

Carry out= do, complete...

an unpleasant episode, usually around fifth grade, and mathematics **aficionados**, who will find much that is new throughout the book. This book also serves readers who simply want to **sharpen** their analytical skills. Many careers, such as law and medicine, require extended, **precise** analysis. Each chapter offers practice in following a sustained and closely argued line of thought. That mathematics can develop this skill is shown by these two testimonials:

G

A physician wrote, The **discipline** of analytical thought processes [in mathematics] prepared me extremely well for medical school. In medicine one is faced with a problem which must be thoroughly analyzed before a solution can be found. The process is similar to doing mathematics.'

A lawyer made the same point, "Although I had no **background** in law - not even one political science course — I did well at one of the best law schools. I **attribute** much of my success there to having learned, through the study of mathematics, and, in particular, theorems, how to analyze principles. **principles**. Lawyers who have studied mathematics can master the legal principles in a way that most others cannot.' I hope you will share my **delight** in watching as simple, even **naïve**, questions lead to **remarkable** solutions and **purely** theoretical discoveries find **unanticipated** applications.

Aficionado= enthusiast, fan, admirer...

Sharpen= enhance, improve...

Precise= exact, accurate...

Discipline= regulation.

Background= experience.

Attribute= to believe or say that a situation or event is caused by something.

Delight= enjoyment, pleasure, happiness, joy...

Naïve= inexperienced, immature...

Remarkable= extraordinary, amazing, outstanding, significant, incredible...

Purely= completely and only...

Unanticipated= unexpected, surprising, unforeseen, unlooked for...

Test 4 READING PASSAGE 1

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**.

Twin= one of two children born at the same time to the same mother.

Precious= valuable, beloved, valued, treasured, cherished...

Untangle= unravel= understand or explain something that is mysterious or complicated.

Nurture= the education and care that you are given as a child, and the way it affects your later development and attitudes.

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 Galton 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

Split= divide, break...

Virtually= almost, nearly...

Due to= because of (negative).

Identical twin= one of a pair of brothers or sisters born at the same time, who develop from the same egg and look almost exactly alike.

Fraternal twin= one of two children born at the same time to the same mother, who developed from different eggs rather than from the same egg, and who do not look alike.

Quantify= count, calculate, measure...

Extent= degree, level...

Ailment= an illness that is not very serious.

Vulnerability= weakness, defenselessness...

Disease= illness, sickness...

Heredity= the process by which mental and physical qualities are passed from a parent to a child before the child is born.

Pinpoint= identify.

Interplay= relationship, interaction...

Reunite= bring back together, come together...

Carry out= do.

Statistical= numerical.

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

Radical= radical ideas are very new and different, and are against what most people think or believe.

Elemental= basic, fundamental...

Tied= linked, joined, related...

Represent= stand for.

Component= part, section, factor, element...

Immense=extremely large, enormous...

Segment= section, part, piece, sector...

Trail= characteristic, feature...

Determine= decide.

Tune= melody.

Revolutionized= develop, transform...

Reveal= show, bring to life...

Pregnancy= when a woman is pregnant (=has a baby growing inside her body).

Fetus= a baby or young animal before it is born.

Hardwired= if an attitude, way of behaving etc is hard-wired, it is a **natural** part of a person's character that they are born with and cannot change.

Unalterable= unchangeable, fixed...

<p>differences, in my view.'</p> <p>Reed <u>credits</u> 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.'</p> <p>Having said that, Reed adds, the latest work in <u>epigenetics</u> 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.'</p>	<p>Trailblazer= someone who is the first to discover or develop new methods of doing something.</p> <p>Mothering= the process of caring for children in the way that a mother does.</p> <p>Reflective= thoughtful, deep...</p>
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<h2>READING PASSAGE 2</h2> <h3>An Introduction to Film Sound</h3> <p>Though we might think of film as an essentially <u>visual</u> experience, we really cannot afford to underestimate the importance of film sound. A meaningful sound track is often as complicated as the <u>image</u> on the screen, and is <u>ultimately</u> just as much the responsibility of the director. The entire sound track consists of three essential ingredients: the human voice, sound effects and music. These three tracks must be mixed and balanced so as to produce the necessary emphases which in turn <u>create</u> desired effects.</p> <p>Topics which essentially refer to the three <u>previously</u> mentioned tracks are discussed below. They include</p>	<p>Essentially= Fundamentally, basically...</p> <p>Underestimate= underrate, undervalue...</p> <p>Complicated= intricate, complex...</p> <p>Ingredient= element, factor, part...</p> <p>Emphasis= special attention or importance.</p>
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dialogue, **synchronous** and **asynchronous** sound effects, and music.

Let us start with dialogue. As is the case with stage drama, dialogue serves to tell the story and expresses feelings and motivations of characters as well. Often with film **characterization** the audience **perceives** little or no difference between the character and the actor. Thus, for example, the actor Humphrey Bogart is the character Sam Spade; film **personality** and life personality seem to **merge**. Perhaps this is because the very **texture** of a performer's voice supplies an **element** of character.

When voice textures fit the performer's **physiognomy** and **gestures**, a whole and very realistic persona emerges. The viewer sees not an actor working at his **craft**, but another human being **struggling** with life. It is interesting to note that how dialogue is used and the very amount of dialogue used varies widely among films. For example, in the highly successful science-fiction film 2001, little dialogue was evident, and most of it was **banal** and of little **intrinsic** interest. In this way the film-maker was able to **portray** what Thomas Sobochack and Vivian Sobochack call, in An Introduction to Film, the '**inadequacy** of human responses when compared with the **magnificent technology** created by man and the **visual** beauties of the universe'.

The comedy Bringing Up Baby, on the other hand, presents practically non-stop dialogue delivered at **breakneck** speed. This use of dialogue **underscores** not only the **dizzy** quality of the character played by Katherine Hepburn, but also the **absurdity** of the film itself and thus its humor. The audience is bounced from **gag** to gag and conversation to conversation; there is no time for audience reflection. The audience is **caught up in** a whirlwind of activity in simply managing to follow the **plot**. This film presents pure **escapism** - largely due to its **frenetic** dialogue.

Synchronous sound effects are those sounds which are synchronized or matched with what is viewed. For example, if the film portrays a character playing the piano, the sounds of the piano are projected.

Dialogue= conversation.

Synchronous= if two or more things are synchronous, they happen at the same time or work at the same speed.

Asynchronous= processes happen at different times or rates.

Characterization= the way in which the character of a real person or thing is described.

Perceive= distinguish, recognize...

Personality= traits, character...

Merge= combine, unite

Texture= the way the different parts of a piece of writing, music, art etc are combined in order to produce a final effect.

Physiognomy= the general appearance of a person's face.

Gesture= a movement of part of your body, especially your hands or head, to show what you mean or how you feel.

Craft= skill, ability, technique...

Struggling= stressed.

Banal=trivial= ordinary and not interesting, because of a lack of new or different ideas.

Intrinsic= natural.

Portray= describe, show...

Inadequacy= insufficiency.

Magnificent= wonderful, outstanding, brilliant...

Breakneck= fast, rapid, quick...

Underscore= emphasize, highlight, underline...

Dizzy= stupid and forgetful.

Absurdity= illogicality, ridiculousness...

Gag= joke, funny story...

be/get caught up in something= to be or get involved in something, especially something bad .

Plot= story line.

escapism = activities or entertainment that help you forget about bad or boring things for a short time

Frenetic= frantic= frenetic activity is fast and not very organized.

Synchronous sounds **contribute** to the realism of film and also help to **create** a particular atmosphere. For example, the 'click' of a door being opened may simply serve to **convince** the **audience** that the **image** portrayed is real, and the audience may only **subconsciously** note the expected sound. However, if the 'click' of an opening door is part of an ominous action such as a **burglary**, the sound mixer may call attention to the 'click' with an increase in volume; this helps to **engage** the audience in a moment of suspense.

Asynchronous sound effects, on the other hand, are not matched with a **visible source** of the sound on screen. Such sounds are included so as to provide an **appropriate** emotional nuance, and they may also add to the realism of the film. For example, a film-maker might **opt** to include the background sound of an ambulance's **siren** while the foreground sound and **image** portrays an arguing couple. The asynchronous ambulance siren underscores the psychic injury incurred in the argument; at the same time the noise of the siren adds to the realism of the film by acknowledging the film's city setting.

We are probably all familiar with background music in films, which has become so ubiquitous as to be **noticeable** in its **absence**. We are **aware** that it is used to add **emotion** and **rhythm**. Usually not meant to be noticeable, it often provides a tone or an emotional **attitude** toward the story and /or the characters depicted. In addition, background music often foreshadows a change in mood. For example, dissonant music may be used in film to **indicate** an approaching (but not yet visible) **menace** or disaster. Background music may **aid** viewer understanding by linking scenes. For example, a particular musical **theme** associated with an **individual** character or situation may be repeated at various points in a film in order to remind the audience of salient **motifs** or ideas.

Film sound **comprises conventions** and innovations. We have come to expect an **acceleration** of music during car chases and creaky doors in horror films. Yet, it is important to note as well that sound is often brilliantly **conceived**. The effects of sound are often

Convince= persuade, prove to...

Subconscious= unintentional

Audience= viewers, watchers...

Burglary= breaking and entering, theft, robbery...

Engage= connect.

Opt= choose, select, decide...

Siren= alarm bell.

Noticeable= clear, obvious...

Absence= nonexistence.

Emotion= feeling.

Rhythm= beat.

Menace= threat, danger...

Motif= pattern.

Comprise= include, contain, consist of...

Convention= rule, standard, principle...

Innovation= improvement, modernization...

Acceleration= speeding up, quickening...

Conceived= created.

largely subtle and often are noted by only our subconscious minds. We need to **foster** an awareness of film sound as well as film space **so as to** truly appreciate an art form that sprang to life during the twentieth century - the modern film.

Foster= promote, encourage...

So as to= in order to, in an attempt to...

READING PASSAGE 3

‘This Marvellous Invention’

A
Of all mankind's **manifold** creations, language must **take pride of place**. Other inventions -the wheel, agriculture, sliced bread - may have transformed our material existence, but the **advent** of language is what made us human. Compared to language, all other inventions pale in significance, since everything we have ever achieved depends on language and **originates** from it. Without language, we could never have **embarked on** our **ascent** to unparalleled power over all other animals, and even over nature itself.

B
But language is **foremost** not just because it came first. In its own right it is a tool of **extraordinary sophistication**, yet based on an idea of ingenious simplicity: ‘this marvellous invention of composing out of twenty-five or thirty sounds that infinite variety of expressions which, whilst having in themselves no **likeness** to what is in our mind, allow us to **disclose** to others its whole secret, and to make known to those who cannot **penetrate** it all that we imagine, and all the various stirrings of our soul’ This was how, in 1660, the **renowned** French grammarians of the Port-Royal abbey near Versailles **distilled** the **essence** of language, and no one since has celebrated more **eloquently** the **magnitude** of its achievement. Even

Manifold= Various, many and different...

Take pride of place= if something has or takes pride of place, it is put in the best place for people to see because it is the thing you are most proud of.

Advent= Arrival, start...

Originate= begin, start, come from...

Embark on= to start something, especially something new, difficult, or exciting.

Ascent= the process of becoming more important, powerful, or successful than before.

Foremost= leading, primary...

Sophistication= complexity.

Extraordinary= strange, unusual, surprising, amazing, special...

Simplicity= straightforwardness...

Likeness= similarity, resemblance...

Disclose= reveal, make known...

Penetrate= go through, enter...

Renowned= famous, well-known...

Distill= to get the main ideas or facts from a much larger amount of information..

Essence= core, heart...

Eloquently= Expressively...

Magnitude= importance, significance...

so, there is just one **flaw** in all these **hymns** of praise, for the **homage** to languages **unique** **accomplishment** **conceals** a simple yet critical **incongruity**. Language is mankind's greatest invention - except, of course, that it was never invented. This **apparent** **paradox** is at the **core** of our fascination with language, and it holds many of its secrets.

C

Language often seems so skillfully drafted that one can hardly imagine it as anything other than the perfected handiwork of a master **craftsman**. How else could this **instrument** make so much out of barely three dozen measly morsels of sound? In themselves, these **configurations** of mouth p,f,b,v,t,d,k,g,sh,a,e and so on - amount to nothing more than a few **haphazard** spits and splutters, **random** noises with no meaning, no ability to express, no power to explain. But run them through the cogs and wheels of the language machine, let it arrange them in some very special orders, and there is nothing that these **meaningless** streams of air cannot do: from sighing the **interminable** boredom of existence to **unravelling** the **fundamental** order of the universe.

D

the most extraordinary thing about language, however, is that one doesn't have to be a genius to set its wheels in motion. The language machine allows just about everybody from pre-modern **foragers** in the subtropical savannah, to post-modern philosophers in the suburban sprawl - to tie these meaningless sounds together into an **infinite** variety of **subtle** senses, and all **apparently** without the slightest **exertion**. Yet it is precisely this deceptive ease which makes language a victim of its own success, since in everyday life its triumphs are usually **taken for granted**. The wheels of language run so smoothly that one rarely bothers to stop and think about all the resourcefulness and **expertise** that must have gone into making it tick. Language conceals art.

E

Often, it is only the **estrangement** of foreign tongues, with their many **exotic** and **outlandish** features, that

Flaw= fault, error...

Hymn= a song of praise to God.

Homage= respect, honor...

Accomplishment= achievement...

Conceal= hide, cover up...

Incongruity=strangeness.

Paradox= inconsistency, contradiction...

Craftsman= someone who is very skilled at a particular craft.

Instrument= tool, gadget...

Configuration= the shape or arrangement of the parts of something.

Haphazard= random, disorganized, not planned...

Meaningless= worthless...

Interminable= endless= very long and boring...

Unravel= to understand or explain something that is mysterious or complicated.

Foragers= hunters, searchers for food and other supplies...

Infinite= never-ending, endless, unlimited...

Subtle= slight= not easy to notice or understand unless you pay careful attention.

Exertion= a lot of mental and physical effort.

Take for granted= undervalue.

Expertise= knowledge, proficiency...

Estrangement= separation, division...

Exotic= unusual, out of the ordinary, strange...

Outlandish= strange, unusual, weird, eccentric...

brings home the wonder of languages design. One of the showiest **stunts** that some languages can **pull off** is an ability to **build up** words of breath-breaking length, and thus express in one word what English takes a whole sentence to say. The Turkish word *çehirliliğitiremediklerimizdensiniz*, to take one example, means nothing less than 'you are one of those whom we can't turn into a town-dweller'. (In case you were wondering, this monstrosity really is one word, not merely many different words squashed together - most of its components cannot even stand up on their own.)

F

And if that sounds like some one-off freak, then consider Sumerian, the language spoken on the banks of the Euphrates some 5,000 years ago by the people who invented writing and thus **enabled** the **documentation** of history. A Sumerian word like *muntuma'a* ('when he had made it suitable for her') might seem rather **trim** compared to the Turkish colossus above. What is so **impressive** about it, however, is not its lengthiness but rather the reverse - the thrifty **compactness** of its construction. The word is made up of different slots, each **corresponding to** a particular portion of meaning. This sleek design allows single sounds to **convey** useful information, and in fact even the **absence** of a sound has been enlisted to express something specific. If you were to ask which bit in the Sumerian word corresponds to the pronoun 'it' in the English translation 'when he had made it suitable for her', then the answer would have to be nothing. Mind you, a very particular kind of nothing: the nothing that stands in the empty slot in the middle. The technology is so fine-tuned then that even a non-sound, when carefully placed in a particular position, has been invested with a specific function. Who could possibly have **come up with** such a **nifty contraption**?

Stunt= something that is done to attract people's attention, especially in advertising or politics.

Pull off= succeed, do well...

Build up= increase...

Enable= allow, make possible...

Documentation= records...

Trim= slim, fit, neat...

Impressive= extraordinary, remarkable...

Compactness= neatness.

Corresponding to= matching, related...

Convey= express....

Absence= lack, nonexistence...

Come up with= to think of an idea, answer etc

Nifty= ingenious, clever, effective...

Contraption= a piece of equipment or machinery that looks funny, strange, and unlikely to work well.