READING PASSAGE 2

You should spend about 20 minutes on Questions 14-26, which are based on Reading Passage 2 below.

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 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. Joel 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

LIVEWORKSHEETS

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 range in the mountains, across a river, and down onto the plains. Here they wait out the frozen months, feeding mainly on sage brush 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.

LIVEWORKSHEETS

Questions 14-18

Do the following statements agree with the information given in Reading Passage 2?

In boxes 14-18 on your answer sheet, write

TRUE *if the statement agrees with the information*
FALSE *if the statement contradicts the information*
NOT GIVEN *if there is no information on this*

14 Local gulls and migrating arctic terns behave in the same way when offered food.

15 Experts' definitions of migration tend to vary according to their area of study.

16 Very few experts agree that the movement of aphids can be considered migration.

17 Aphids' journeys are affected by changes in the light that they perceive.

18 Dingle's aim is to distinguish between the migratory behaviours of different species.

LIVEWORKSHEETS

Questions 19-22

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

Write the correct letter, A-G, in boxes 19-22 on your answer sheet.

19 According to Dingle, migratory routes are likely to

20 To prepare for migration, animals are likely to

21 During migration, animals are unlikely to

22 Arctic terns illustrate migrating animals' ability to

A	be discouraged by difficulties.
B	travel on open land where they can look out for predators.
C	eat more than they need for immediate purposes.
D	be repeated daily.
E	ignore distractions.
F	be governed by the availability of water.
G	follow a straight line.

Questions 23-26

Complete the summary below.

Choose *ONE WORD ONLY from the passage for each answer.*

Write your answers in boxes 23-26 on your answer sheet.

The migration of pronghorns

Pronghorns rely on their eyesight and 23 ..... to avoid predators. One particular population's summer habitat is a national park, and their winter home is on the 24 ..... , where they go to avoid the danger presented by the snow at that time of year. However, their route between these two areas contains three 25 ..... . One problem is the construction of new homes in a narrow 26. ..... of land on the pronghorns' route.

LIVEWORKSHEETS

READING PASSAGE 3

You should spend about 20 minutes on Questions 27-40, which are based on Reading Passage 3 below.

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.

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

LIVEWORKSHEETS

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 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 complicated 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 naive, questions lead to remarkable solutions and purely theoretical discoveries find unanticipated applications.

LIVEWORKSHEETS

Questions 27-34

Reading Passage 3 has seven sections, A-G. Which

section contains the following information?

Write the correct letter, A-G, in boxes 27-34 on your answer sheet. NB You

may use any letter more than once.

27 a reference to books that assume a lack of mathematical knowledge
28 the way in which this is not a typical book about mathematics
29 personal examples of being helped by mathematics
30 examples of people who each had abilities that seemed incompatible
31 mention of different focuses of books about mathematics
32 a contrast between reading this book and reading other kinds of publication
33 a claim that the whole of the book is accessible to everybody
34 a reference to different categories of intended readers of this book

LIVEWORKSHEETS

Questions 35-40

Complete the sentences below.

Choose ONE WORD ONLY from the passage for each answer.

Write your answers in boxes 35-40 on your answer sheet.

35 Some areas of both music and mathematics are suitable for someone who is a ..... .

36 It is sometimes possible to understand advanced mathematics using no more than a limited knowledge of ..... .

37 The writer intends to show that mathematics requires ..... thinking, as well as analytical skills.

38 Some books written by ..... have had to leave out the mathematics that is central to their theories.

39 The writer advises non-mathematical readers to perform ..... while reading the book.

40 A lawyer found that studying ..... helped even more than other areas of mathematics in the study of law.

LIVEWORKSHEETS

Practice test

Listening

Section 1 Questions 1–10

Questions 1–5

26 Complete the notes below. Write **NO MORE THAN ONE WORD AND/OR A NUMBER** for each answer.

Details of the car

Age / mileage: about (1) ..... years old and has done approx. 40,000 miles.

History: had (2) ..... previous owners.

Reason for sale: selling it because has a (3) ..... in London – no car needed.

Final price: agreed (4) £.....

Appointment: offered to meet on Saturday, at (5) ..... a.m., in the café.

Questions 6–10

27 Complete the form below. Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.

WAYNE'S WHEELS INSURANCE

APPLICATION FORM

Name:	Mohammed (6) .....
Date of birth:	21st (7) .....
Car make:	Peugeot (8) .....
Registration number:	(9) .....
Address:	78 Acacia Avenue, Stourbridge, Wolverhampton, BM56 YLM
Total annual insurance (incl. admin charge):	(10) £.....

Section 2 Questions 11–20

Questions 11 and 12

28 Choose the correct letter, **A**, **B** or **C**.

11 All the students on the course
- **A** are native English speakers.
- **B** are from Asian countries.
- **C** have jobs in law.

12 The blended learning course is
- **A** taught face-to-face for half of the year.
- **B** taught online with two face-to-face meetings.
- **C** taught completely online with virtual exams.

LIVEWORKSHEETS

Questions 13–17

28 Complete the flow chart. Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.

How to use the virtual learning platform (VLP)

Log-on to the platform. Download the first (13) ..... and .....

Buy books on (14) ..... or download them from VLP

If you need help, contact tutor by (15) ....., or phone.

If you prefer, ask students for help via the (16) .....

Get (17) ..... from tutor on VLP a week later.

Questions 18–20

Choose **THREE** letters **A–F.**

What **THREE** things can you do on the blended learning course?

A participate in seminars at any time
B meet with your tutor at regular times
C listen to lectures at a time of your choice
D study on a full-time basis at a distance
E have more time to finish an assignment
F have another year to complete your degree

Section 3 Questions 21–30

Questions 21–26

29 Complete the sentences below. Write **NO MORE THAN ONE WORD** for each answer.

21 The tutor is pleased that Jane is always well ..... for seminars.
22 Jane enjoys the psychology seminars and is good at .....
23 The lecture on critical thinking was about asking particular types of .....
24 Jane should think about the ..... supporting other students' theories.
25 The tutor is ..... that Jane makes claims which are not proved.
26 Jane needs to use more ..... as evidence for claims she makes.

Questions 27–30

What are the disadvantages of each type of research?

Choose your answers from **A–F** below and write the letters next to questions **27–30.**

27 Case studies .....
28 Research papers .....
29 Interviews .....
30 Questionnaires .....

A don't give very detailed information.
B can encourage a particular answer.
C don't provide enough information.
D may make a theory or argument weaker.
E can produce very unscientific results.
F can be out-of-date.

LIVEWORKSHEETS

Section 4 Questions 31–40

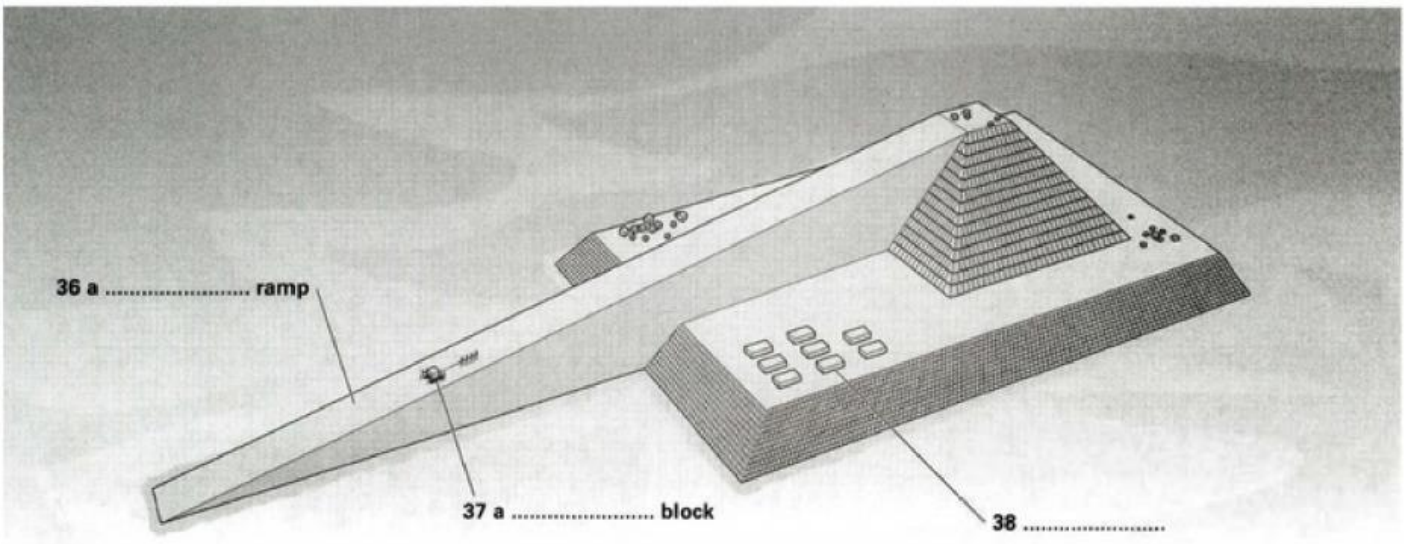
Questions 31–35

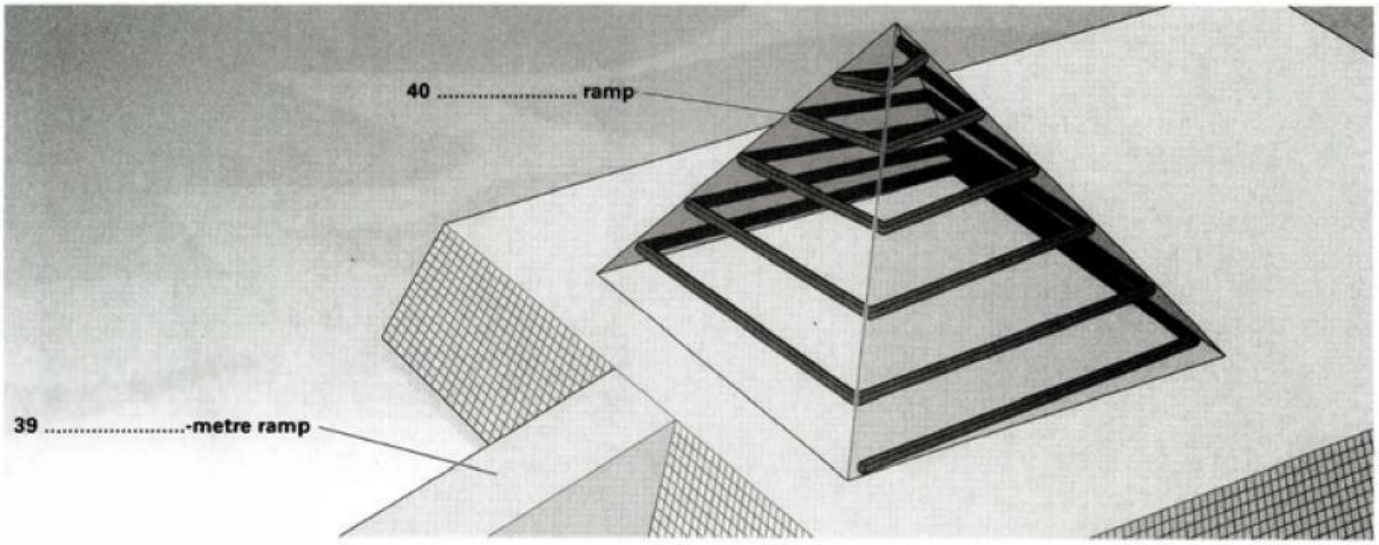
Complete the table below. Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.

The Great Pyramid of Khufu	
Reason for interest	Because of the (31) ..... and size of the pyramid
(32)	5.9 million tons
Height	(33) ..... metres tall
Materials	(34) ..... stone blocks
Date	2550 BC: took (35) ..... to complete
Number of workers	20,000–30,000
Mystery	How could workers move a stone block weighing two tons?

Questions 36–40

Complete the diagrams. Write **NO MORE THAN ONE WORD AND/OR A NUMBER** for each answer.





LIVEWORKSHEETS