THE SEARCH FOR LIFE

The table in Sarah Gavit's sunny office at the Jet Propulsion Laboratory in California, is covered with discoloured pieces of metal, most of them shaped like bullets[1]. Sarah's table is a museum of one of the most adventurous space experiments ever planned: two probes[2] that will dig into the surface of Mars at 400 miles per hour and look out for signs of whether the planet did once support life. To design them, Gavit began building and testing prototypes in 1995.

Late this week, if all goes well, two of these oval shells will cross the Martian sky. These probes, travelling at a terrific speed, will go deep into the ground. They will capture some soil[3] and drop it into a little box for later analysis. In front of her computer at JPL, Gavit will be examining the data for hints of water ice, a sign that once, long ago, life might have existed on our sister planet. And if there is frozen water, there may still be liquid water deep in the warmer underground.

It is spring in the Southern hemisphere of Mars, and the south polar ice is melting. Just as spring means the renewal of life on Earth, many scientists hope that the Martian spring will bring clues to the existence of life on the Red Planet.

These days the signs of water on Mars have become even more puzzling. Earlier missions discovered deep channels running thousands of miles. They seem to have been formed by water –torrents running with the force of 10.000 Mississippi Rivers. But the channels do not continue far. They disappear really quickly. Where did the water go? Ten years ago some scientists thought that they could see long, curving lines in some old photos of Mars. New observations suggest that they may be ancient beaches. Why? On the one hand, the line stays at a near-constant elevation, which evokes the image of some kind of sea level. Also, these curves are as flat and smooth[4] as the floors of the deepest seas on Earth, which are the result of sediments throughout centuries.

For years the official view on Martians has been that the environment is too hostile for them: it's cold and it's dry, and the thin atmosphere is as useless against solar radiation as a paper umbrella against a big rainstorm. With no liquid water on the surface, the planet would not be able to sustain life. Or so it seemed. The fact is that on the Earth "we have found microbes living in complete darkness inside rocks in the dry valleys of Antarctica and eating hydrogen," says Hubbard. Other microbes sustain life by dissolving minerals –they eat rocks. Others live in sulfuric acid, at 212 degrees Fahrenheit, or in extremely difficult environments as vinegar or ammonia. Apparently, life is pretty loose where it lives. "If life ever got started on Mars," says Jim Head, "then I'd very difficult to eradicate it. Once the surface became inhospitable, life would go underground."

[1] *bullet*: bala / bala
[2] *probe*: sonda / sonda
[3] *soil*: terra / tierra
[4] *smooth*: llis / liso

PART ONE: READING COMPREHENSION

Answer the following questions according to the information in the text “The Search for Life”.
[1 point each correct answer]

1. What makes the presence of water on the Red Planet intriguing?

2. The text suggests two different views on the possibility of life in Mars. What are they?

3. What are the different steps in Sarah Gavit’s experiment?

4. Which of the following sentences summarises the text best?

    a) Life requires environmental conditions, among them water, which are not present on the Red Planet. However, water and life are extremely difficult to eradicate. In some scientists’ opinion, if water and life ever existed on Mars, there may be still some underground water and life today.

    b) Sarah Gavit built probes to confirm the existence, a long time ago, of deep water channels –torrents as powerful as 10.000 Mississippi rivers. Lines in old photographs suggest ancient beaches and deep-sea floors. Spring, with the south polar ice melting, is the best season for sending probes.

    c) Water is crucial to the question of life on Mars. Sarah Gavit builds her probes to collect data and analyse them for signs of water ice. Old photos suggest ancient rivers and seas. However, life can exist in very adverse circumstances. Even in its absence, we might consider life on Mars possible.

PART TWO: WRITING

Choose ONE topic. Write about either 1 or 2. Write between 75 and 100 words.
[Grammatical accuracy: 3 points. Writing fluency: 3 points]

1. Write a short essay. Is there an area of science that interests you? Write about it. Talk about inventions or discoveries. Say things you know or express your opinion about present developments.

2. Write a dialogue. Two people are talking about life outside our planet. Choose who they are: friends, scientists, two writers planning a story, etc. They express their ideas and discuss them.

HOW DO YOU BUILD A PYRAMID?

Kneeling before a 180-kg concrete obelisk in the hills northwest of Los Angeles, Maureen Clemmons murmurs a prayer to the ancient Egyptian god of wind. An hour passes. Then a strong air-current straightens the strings that connect the obelisk to two nylon kites[1], shaped like the ones used in parasailing[2]. Very soon the kites start pulling the obelisk and drag it across a green grassy field. Clemmons and her 12 assistants cheer vigorously.

For three years, Clemmons, 42, who runs a hair-care-products company and has no formal scientific training, has spent all her spare time and more than $10.000 of her own money trying to solve everyone's favourite engineering enigma: how the Egyptian pyramids were built. Over the years, researchers have experimented with everything from ramps to levers[3] in failed attempts to move duplicates of the three-ton pyramid stones.

Inspired by winds that hit her home in Reseda, Calif., each November, Clemmons recalled[4] that even stronger winds blow in Egypt from February through June. Then she remembered that the Egyptians mass-produced linen[5] for their boat sails, and that some hieroglyphs suggest that the pyramids were raised by "invisible gods in the sky." Clemmons concluded that the ancient Egyptians could have used a system of large kites to lift the pyramid stones into place.

Does it sound ludicrous? That's what most of her friends said. So Clemmons did some research and talked to Mory Gharib, an aeronautics engineer at the California Institute of Technology, who surprised everyone by supporting her concept. "It needs more study," Gharib says, "but all of the mathematics works". Others were persuaded by what they saw. "I thought it was bullshit," admits Lynn Velazquez, an administrator at Pepperdine University. "Then I saw Maureen use a kite to lift up a heavy log, and I started to believe."

The kite theory evokes a rolling of eyes, however, from professional Egyptologists, most of whom believe the pyramid builders used ramps. Many of these experts are fed up with so many amateurs pushing bizarre theories that often involve space aliens. Mark Lehner, a Harvard archaeologist widely regarded as the leading U.S. expert on the pyramids, was so shocked at the kite theory that he declined comment. Zawi Hawass, Under Secretary of State for Egypt's Giza plateau, explained that "Egyptologists call people with these kinds of theories 'pyramidiots.'"

To carry out further tests in California's Mojave desert a $100.000 research fund is needed. To that end, Clemmons has persuaded several companies to collaborate on a new perfume labelled Ala (Latin for "wing") that will sell in pyramid-shaped bottles. The profits will go to the kite-research project.

If these additional tests are successful, Clemmons wants to demonstrate her theory on a much grander stage in the shadow of the Giza pyramids outside Cairo. "Other research expeditions had a bunch of men pushing and pulling," she says. "Mine will be me and my girlfriends with kits and a pack of beer, sitting in lawn chairs, waiting for the wind to kick up."

[1] *kite*: estel / cometa
[2] *parasailing*: parasailing (paracaigudisme aquàtic / paracaidismo acuático)
[3] *lever*: palanca / palanca
[4] r*ecall:* recordar / recordar
[5] *linen*: lli, roba de fil / lino, tejido de lino

PART ONE: READING COMPREHENSION

Answer the following questions according to the information in the text “How Do You Build a Pyramid?”.
[1 point each correct answer]

1. What are the reactions towards Maureen’s kite theory?

2. What factors support or contradict her theory?

3. What is unusual about Maureen’s team of researchers?

4. Which of the following sentences summarises the text best?

   a) Maureen spends her own time and money to prove her kite-theory about pyramid building. Reactions go from shock to convinced support. The theory seems mathematically right and the experiments in the desert work. She is collecting money to continue them in the USA and then in Africa.

   b) Maureen says a prayer to the god of wind before the experiment. To demonstrate her kite theory she wants the opinion of archeologists and engineers but they are all appalled at it. Some companies sell a new perfume called ‘Ala’. This is good advertising for them but little money goes to the project.

   c) Gharib, Lehner and Hawass help Maureen, who has no scientific preparation. With 12 assistants she is experimenting in the Mojave desert but wants to demonstrate her theory in Egypt. She has spent all her money but now some companies sell a new perfume and give the money to the research project.

PART TWO: WRITING

Choose ONE topic. Write about either 1 or 2. Write between 75 and 100 words.
[Grammatical accuracy: 3 points. Writing fluency: 3 points]

1. Write a short essay. What does an archaeologist, a historian or an artist need to know? Do these people need scientific training? Can science –maths, physics, chemistry, biology, computing, etc.– help them?

2. Write a dialogue between two people. They discuss things people do as hobbies in their spare time. They express their opinions about them.