READING

Telescope to detect ET on his mobile

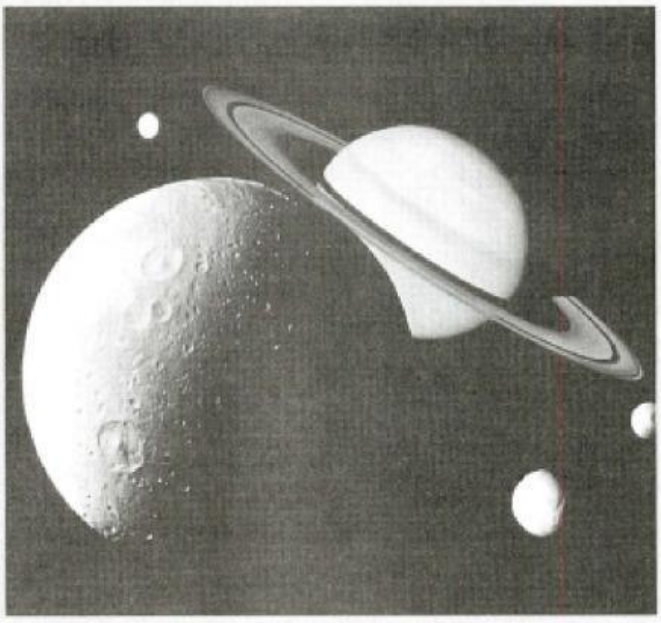
A Astronomers are planning to build the world's largest telescope – a machine so powerful it could detect radio signals from a planet up to 50 light years, or 13.5 billion years from Earth. The giant radio-telescope is called the Square Kilometre Array (SKA) and will consist of 3,000 separate radio dishes and other antennae all linked together into one huge machine. It will generate 100 times more data than all the information currently on the Internet and will need the world's most powerful supercomputer to analyze the information it collects.

B The SKA will work in a similar way to other large radio telescopes such as Australia's CSIRO Parkes radio telescope, also known as 'The Dish'. The telescope gets its name from the bowl-shaped reflector called a 'dish' that is used to collect radio waves from space. The reflector focuses the waves onto an antenna that changes them into electric signals. From the antenna, the signals are transmitted down into the control room at the base of the telescope and are picked up by a radio receiver. This receiver makes the signals stronger. The signals are then analyzed by a computer at another location and the information is used to draw a picture of the source of the radio waves.

C Compared to 'The Dish', however, SKA will be thousands of times more sensitive. This sensitivity is because of its size; the larger the dish, or the more dishes there are, the more powerful the radio signal can be, allowing unknown areas of the universe to be discovered. 'We know that the universe is incredibly vast, containing hundreds of billions of stars,' said Richard Schilizzi, director of the SKA project. 'However, at present we can only see a fraction of what is out there. The SKA will enable us to explore some of its furthest reaches.' Scientists hope to find alien life intelligent enough to invent radio. The SKA will be able to detect a mobile phone system within 50 light years of Earth, but will also probably be able to scan star systems which are much further away, because any advanced life form would have powerful radio emitters such as radar and radio stations.

D But looking for evidence of extraterrestrial life is just one of many tasks for the SKA. Scientists also hope that the telescope *will help them* to understand how the first stars and planets were formed, during a period of time called 'first light'. 'The SKA is a bit like a time machine,' said Phil Diamond, head of the astronomy and space science division of CSIRO, the Australian government's research arm. 'It will gather radiation emitted more than 13 billion years ago, allowing us to get a picture of what the universe looked like then. By choosing the type of radiation we look at, we can get similar pictures of the universe from any other era we choose – so we can watch how it evolved.'

E More than 20 countries will share the estimated £1.4 billion cost of the project for the telescope. Two potential sites have been chosen, one in Western Australia and the other in South Africa. Both are in the southern hemisphere because this will give the instrument a direct line of sight into the heart of the Milky Way. The SKA must be built on a site completely free of radio interference – with the host country promising it will prevent the construction of any mobile phone, radio or TV masts for up to 50 years. This means it will have to be built mainly in a desert – either in the outback of Western Australia or the Karoo of South Africa.



Questions 1–4

Reading Passage 1 has five paragraphs, **A–E.**

Choose the correct heading for paragraphs **B–E** from the list of headings below.

List of headings

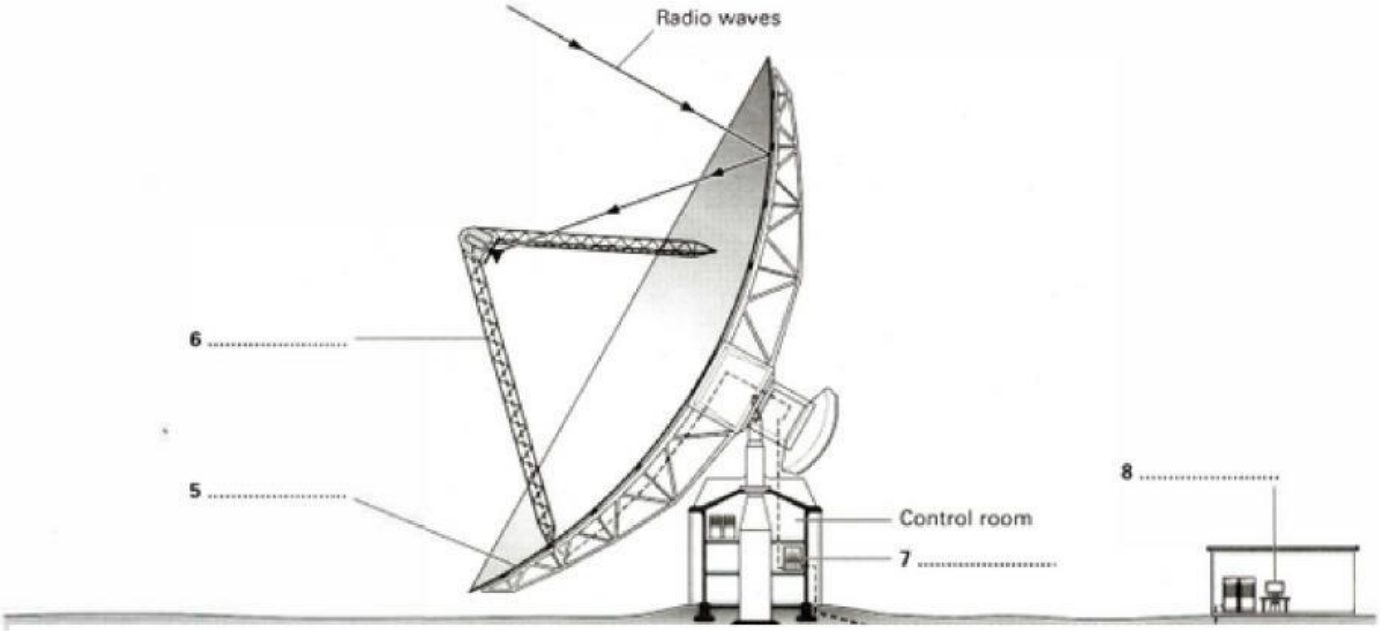
- **i** Budgeting for the construction of SKA
- **ii** Discovering the secret origins of our universe
- **iii** Abilities of advanced life forms
- **iv** Potential to see further than before
- **v** Methods of mapping the location of the planets
- **vi** Plans for the world's largest telescope
- **vii** Location considerations for SKA
- **viii** The collection and analysis of radio waves

Example	*Answer*
Paragraph A	vi

Questions 5–8

The diagram below shows how a large radio telescope works.

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



Questions 9–13

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

Write:

TRUE	if the statement agrees with the information
FALSE	if the statement contradicts the information
NOT GIVEN	if there's no information on this

9 The SKA will be made from many parts.
10 The SKA will be the world's most powerful telescope.
11 About one third of the universe has been discovered.
12 Scientists hope to get in touch with aliens by mobile phone.
13 Governments have decided where the SKA will be built.

Reading

Reading Passage 2

You should spend about 20 minutes on questions **14–26**, which are based on Reading Passage 2 below.

The Real Price of Gold

Like many of his Inca ancestors, Juan Apaza spends every day digging for gold. For 30 days each month Apaza works, without pay, deep inside a mine above the world's highest town, La Rinconada. For 30 days he faces terrible dangers – explosions, poisonous gases, tunnel collapses – to find the gold that the world demands. Apaza does all this, without pay, so that he can spend the 31st day of the month taking as much rock as he can carry from the mine for himself. This rock may contain a lot of gold which could make Apaza a very wealthy man, but it may be completely worthless. But unbelievably, Apaza and his fellow miners want to take that risk. 'It's a cruel lottery,' says Apaza. 'But at least it gives us hope.'

For more than 500 years the dream of gold has attracted people to this place in Peru. The first were the Inca, then the Spanish, whose search for gold and silver led them to take over the New World. But it is only now, as the price of gold increases dramatically – it has risen 235 percent in the past eight years – that 30,000 people have come to La Rinconada, turning this once quiet village into a horribly polluted town on top of the world. La Rinconada is not a pleasant place to live in or to visit. During my time here, I feared for my health and safety. La Rinconada has few basic services: no piped water, no pollution control, no postal service, not even a police station. It's a dangerous place, where no law is respected.

The dirt and rubbish on the overcrowded streets are small problems compared with the tons of poisonous mercury released during the process of separating gold from rock. According to Peruvian environmentalists, the mercury released at La Rinconada and the nearby mining town of Ananea is poisoning rivers and lakes down to the coast of Lake Titicaca, more than a hundred miles away.

Admittedly, gold mines do have a few advantages: they can bring jobs, technologies, and development to poor areas. Gold mining, however, wastes more energy per ounce than any other metal. To mine a single ounce of gold – the amount in a typical wedding ring – requires the removal of more than 250 tons of rock. Yet the public continue to buy it even though the price of gold is rising dramatically. Jewellery shops are, without doubt, partly to blame. They are responsible for two-thirds of the demand for gold, and made $53.5 billion in worldwide sales last year. Disappointingly, the origin of the gold and the damage caused by gold mining doesn't seem to concern them. Despite action groups trying to stop jewellery shops from selling gold from mines that cause serious damage, many countries which rely on the sale of gold to help the economy ignore the protests.

In many ways, people are interested in gold because there's not much of it. In all of history, only 161,000 tons of gold have been mined, only just enough to fill two Olympic-size swimming pools. More than half of that has been taken out of the ground in the past 50 years. Now the world's supplies of gold are quickly going down and new discoveries are rare. Most of the gold left is underground in far-off places which are often beauty spots. It's only a matter of time before these are discovered by the mining companies.

Questions 14–17

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

14 Apaza works in the gold mine because
- **A** he needs a full-time job.
- **B** he earns a lot of money at the end of the month.
- **C** he could become very rich one day.
- **D** his family have always worked in a mine.

15 The most serious problem described in La Rinconada is
- **A** the increase in the price of gold.
- **B** the over-crowded gold mining villages.
- **C** the poison released into the water.
- **D** the lack of facilities in La Rinconada.

16 Gold mining causes
- **A** poverty and unemployment.
- **B** energy to be wasted.
- **C** the price of gold to increase.
- **D** action groups to blame jewellers.

17 There is a shortage of gold because
- **A** the gold is in protected areas.
- **B** people haven't discovered where it is yet.
- **C** a lot of it has been mined already.
- **D** the gold is difficult to reach.

Questions 18–21

Do the following statements agree with the writer's opinion given in Reading Passage 2?
Write:

YES	if the statement agrees with the opinion of the writer
NO	if the statement contradicts the opinion of the writer
NOT GIVEN	if it's impossible to say what the writer thinks about this

18 The benefits of gold mining are greater than the drawbacks.
19 La Riconada is not a pleasant place to live.
20 Jewellery shops shouldn't sell gold.
21 Nature should be protected from miners.

Questions 22–26

Complete the summary using the list of words, **A–E** below.

Gold mining is a very (22) ..... and dirty business, both for the miners and for the (23) ..... Unfortunately, it's also very profitable. As the supply of gold has decreased, the price of it has gone up, resulting in a higher demand for gold than ever before. (24) ..... in particular, are responsible for the increased demand. Although mining does create (25) ..... it also creates a lot of waste and (26) ..... which damages towns, water supplies and areas of natural beauty.

- **A** jewellers
- **B** employers
- **C** dangerous
- **D** miners' families
- **E** risk
- **F** improvements
- **G** environment
- **H** jobs
- **I** pollution

Reading Passage 3

You should spend about 20 minutes on questions **27–40**, which are based on Reading Passage 3 below.

History of Silk Production

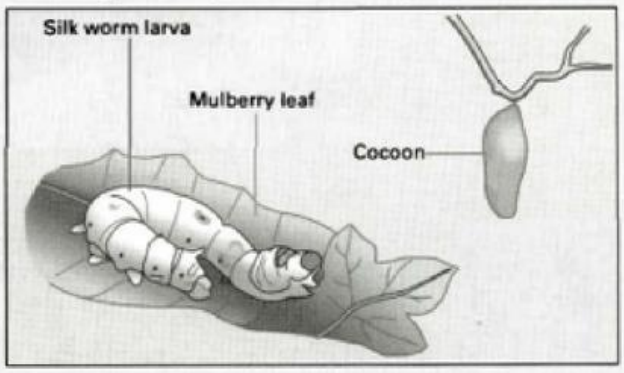
Silk from the moth, *Bombyx mori* (L.), has a long and colourful history unknown to most people. Silk production was discovered in 2,700 BC, almost 5,000 years ago. Chinese legend tells the story of Si Ling Chi, a Chinese princess, who sat in the shade of her court garden, sipping tea beneath mulberry trees. She heard a tiny noise in the leaves above her, and a white cocoon dropped into her teacup. Instead of picking it out of her drink, she watched as the hot water began to dissolve it. Soon her tea was full of shining silk threads and Si Ling Chi imagined the beautiful clothes she might create for her husband.

Si Ling Chi went on to develop sericulture, the science of silk production. She learned to keep silk worms, to collect the silk fibres, to test them for strength, and how to weave them into clothes. Si Ling Chi was later honoured with the name *Seine-Than*, or 'The Goddess of Silk Worms'. Sericulture during the following centuries spread through China and soon became a state secret. It remained a mystery to other countries for thousands of years. In 139 BC, the world's longest highway was opened, from eastern China to the Mediterranean Sea. One of the most valuable commodities to travel along the road was silk and for this reason, the road was named 'Silk Road'. By the middle of the first century AD, people in Rome were becoming frustrated that they could not learn the secrets of the valuable material but the Chinese kept the secrets of sericulture so safe that the early Romans never learned it.

The Chinese finally lost their secret to India. According to legend, the egg of the silk moth and the seed of the mulberry tree were carried to India hidden in the headdress of a Chinese princess. From India the silk industry spread into Persia and Central Asia. The emperor Justinian gained the secrets of sericulture for the Roman Empire in 522 AD, when Persian monks brought the eggs into the country illegally. In 877 AD, the soldier Biachu captured Canfu, the centre of foreign silk trade in China, destroyed all of the mulberry trees and silkworms of the region, and put high taxes on all foreign trade. These actions stopped China exporting silk and other goods for more than 60 years. However, by this time, silk production was practised in Western Asia and Eastern Europe and the price of silk around the world remained the same. During the 18th and 19th centuries, Europeans also made important progress in silk production. England improved silk-weaving techniques and roller printing. In 1801, A Frenchman named Joseph Jacquard exhibited his new machine for silk weaving and this gradually spread through the industry. These advances introduced a more mechanized and scientific approach to silk production than existed previously.

Sericulture has also been attempted in the United States, but has been largely unsuccessful. Hoping to make a lot of money, thousands of individuals bought mulberry plants and planted large areas of valuable land. The money they spent was more than the money that was made, and bad weather destroyed the plants. In the course of a few years, many failures and great disappointments caused the USA to almost give up sericulture. Although there were several more attempts at sericulture in California from the 1860's through the early 1900's and some silk was produced during this time, most attempts failed and sericulture never became permanently established in the state.

Silk production today is a mix of the ancient and the modern. The first stage of silk production is hatching the silkworm eggs. Larvae are then fed cut-up mulberry leaves and after a period of time they spin their silken cocoons. The silk thread comes from the head of each larva and is stuck together with a sticky substance called sericin. Cocoons are later washed in hot water to remove the sericin, which frees the silk threads. Single threads are then combined to form yarn. This yarn is eventually wound onto reels. The yarn is dried, packed according to quality, and is now ready for sale.



World silk production has approximately doubled during the last 30 years in spite of the competition from man-made fibre. China during this period has been responsible for over 50% of the world production of silk each year. Consequently, the country that first developed sericulture approximately 4,700 years ago has again become the world's main producer of silk.

Questions 27–31

Match each event with the correct nationality **A–H**.

A Chinese
B Romans
C Indians
D Persians
E Europeans
F Americans

27 invested money in silk production
28 learned about silk illegally
29 made silk production mechanical
30 make half of the world's silk
31 were the first, after the Chinese, to learn about silk

Questions 32–35

Choose **FOUR** letters **A–F**.

Which **FOUR** of the following statements are true of silk?

A It is a entirely man-made fibre these days.
B Its production was discovered by accident.
C Its production was modernized in the 18th century.
D It was more successful in the past than now.
E Its production is a combination of old and new methods.
F Its production reached Europe from Persia.

Questions 36–40

Complete the flow chart.

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

Process of silk production

Hatching
Silkworm (36) ..... hatched.

Feeding
Larvae fed (37) ..... from the mulberry tree.

Spinning
Larvae produce thread from (38) ..... .

Washing
(39) ..... washed to separate silk threads.

Packaging
Silk (40) ..... created and packaged for sale.