



CANDIDATE
NAME

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CENTRE
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CANDIDATE
NUMBER

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0510/22

October/November 2023

2 hours

No additional materials are needed.

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Dictionaries are **not** allowed.

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages. Any blank pages are indicated.

Exercise 1

Read the article about some ancient rock art in a place called Serranía la Lindosa in Colombia, South America, and then answer the following questions.

Ancient rock art in Colombia

‘There are thousands of these prehistoric paintings,’ the researcher said, pointing to a high rock wall covered with pictures of humans, animals and abstract patterns, all in the same reddish colour.

I had joined some archaeologists studying ancient rock art in the Serranía la Lindosa mountains in Colombia. It’s thought that humans first settled in the region about 13 000 years ago. Some of the paintings may have been created no more than 400 years ago, but it seems likely that others date back to 12 500 years ago. ‘We have different ways of finding out how old the images are,’ one archaeologist told me. ‘We’ve found tools made of animal bone which we think were used by the people who did the paintings, and we know how to estimate the age of these tools. Also, there are some paintings that show animal species which died out about 12 000 years ago – so they must’ve been painted before that.’ The archaeologist also described how her team had done tests on ancient fruit seeds found at the site. ‘People responsible for some of the paintings probably ate that fruit and the tests give us accurate information about the age of the seeds – which tells us how old the paintings are.’

Some of the extinct animals painted on the rocks were huge; they include prehistoric relatives of elephants. This indicates that the region around the art-covered cliffs has changed considerably. Thousands of years ago, there were open grasslands – the best environment for large animals – rather than the thick jungle it has since become.

Serranía la Lindosa is not very accessible; arriving by plane is not an option. Our journey there from the town of San José del Guaviare was supposed to be a two-hour drive, followed by a four-hour trek through the jungle. A flat tyre delayed us initially, however. Then, we were held up by flooding on the route through the jungle. But despite this, it was fascinating. The jungle was full of wildlife – including monkeys, birds and plants that we would later see illustrated in the rock art. There was one thing that I never felt very comfortable about, however. The crocodiles in the rivers were easy to avoid, but the jungle is home to very poisonous snakes, which I certainly didn’t want to meet.

You could spend days staring at the rock paintings, but certain features stood out for me. I loved the pictures of prehistoric horses. They seemed very natural. What struck me more than anything, though, was how detailed they were. However, because these animals are now extinct, we can’t be sure how realistic the images are.

Many of the paintings are high up on the cliffs. I asked a researcher how the painters got up there. ‘We’ve looked for the remains of ropes but haven’t found any,’ she said. ‘We’ve discovered fish bones, and analysis of them tells us a little about the painters’ diet and when they lived. But we now believe they climbed wooden towers to work. There are clues in a few paintings.’ She then pointed out pictures on the rock wall of large man-made structures.

Some of the art shows human activity. As far as I’m aware, images of people actually involved in painting are yet to be found. There are some where human figures are clearly dancing, however. I don’t know if there are any scenes of everyday routines like toolmaking or cooking, although burnt wood has been found, showing they were able to make fires at the time. I also saw some paintings with individuals hunting. It’s a fascinating view into an ancient world.

- 1 When do experts think the oldest rock art at Serranía la Lindosa was made?
..... [1]
- 2 What was the surrounding area like when the early rock art was made?
..... [1]
- 3 What caused the writer to take longer than expected to reach Serranía la Lindosa? Give **two** details.
.....
..... [2]
- 4 What did the writer feel anxious about during the journey to Serranía la Lindosa?
..... [1]
- 5 What impressed the writer most about the paintings of horses?
..... [1]
- 6 How do experts think the artists were able to paint high up on the rocks?
..... [1]
- 7 What does the rock art show people doing? Give **two** details.
.....
..... [2]
- 8 What evidence has helped experts to work out when the rock art was made? Give **four** details.
.....
.....
.....
..... [4]

[Total: 13]

Exercise 2

Read the article about four students (A–D) who are taking part in science projects. Then answer Question 9(a)–(j).

Science projects**A Pedro**

My science class is helping with the development of an app. The scientist behind the app explained the idea to us. Apparently, food production causes massive environmental damage and contributes to climate change. At the same time, about 30% of all food gets thrown away, which creates even more pollution. When he said that, I couldn't believe it. Why would people waste so much food? But it's true. The scientist has got thousands of students around the world to gather data for the app, which is amazing. Whenever we have a meal, we upload photos of it and other information. The software then calculates the environmental effect of producing that meal, and what impact there would be if it was thrown away. When it's fully developed, the app will educate users and, hopefully, they'll waste less food. The research is fun and not particularly complex, but whether we should be working hard for ten weeks on it is something I have doubts about.

B Miriam

When our biology teacher announced the butterfly project, I can't say I was very enthusiastic at first. I couldn't understand why all through September and October we had to record all the butterflies we saw and where we saw them. So, when a butterfly expert gave a talk to prepare us for it, I didn't really concentrate, which I should've done. When the project was starting, I found myself annoying others in my group by having to check with them what I should be doing. Twice a week, we search for butterflies in the school grounds. We take photos and record location details. Then we upload everything to a website for scientists to analyse. I already know much more about butterflies than before, including the key role they have in nature. Now I understand that in order to protect them, information from an extended period is required. And giving the scientists all that valuable data makes me feel really good about myself.

C Wei

I live in a region that's famous for winter sports. In recent years, however, we haven't had much snow, which is a major concern, and not something you'd expect in a place like this. Scientists are trying to get a detailed picture of how conditions are changing, but it's a huge task and they depend on volunteers to collect data. I'm in a group at school that takes various measurements, such as snow depth, in the local area. The scientists always tell us what a good job we're doing, which is nice of them – I'm sure they're very busy. Collecting the data isn't very complicated, but it takes time and you have to do it regularly. Some members of my group complain that what we're doing won't bring snow to the area, so it seems pointless. I get what they're saying, but their attitude gets on my nerves. It's just not helpful.

D Samuel

I'm doing a project with two other students from my science class. I was worried initially because they tend to argue with each other a lot, which can be annoying, but, luckily, this time we quickly agreed to do some research for the StarCount study. The idea is to measure light pollution around the world. We first watched a video explaining the research. Then, using cardboard, tape and string, we constructed a 'viewing tube', through which we look at different sections of the night sky. We have to count the stars we see every day for two weeks and upload our results to the website. According to the StarCount organisers, we've already provided useful data. Also, it's been a nice change from science lessons as it's involved making something with our hands and hardly any reading. On the other hand, it's all been very straightforward and I haven't learned much, which is a pity. At least there haven't been any arguments, though!

9 For each question write the correct letter A, B, C or D on the line.**Which person ...**

- (a) mentions becoming irritated with people during the project? [1]
- (b) is impressed by the size of the project? [1]
- (c) thinks that the project isn't challenging enough? [1]
- (d) regrets paying too little attention during some of the training? [1]
- (e) suggests that the project requires too much commitment? [1]
- (f) is proud of contributing to some important research? [1]
- (g) likes the practical nature of the project? [1]
- (h) appreciates feedback they receive? [1]
- (i) admits to changing their opinion about the aims of the project? [1]
- (j) says that they learned something that surprised them? [1]

[Total: 10]

Exercise 3

Read the article about birds called parakeets, which are native to Africa and India but have become common in London, and then complete the notes.

The parakeets of London

I'd arranged to meet bird expert Adam Shaw in Hyde Park in central London. When I got there, two green-coloured birds were greedily taking seeds from his hands while some excited children watched on. 'It's hardly surprising that the population of parakeets in London is growing,' Shaw said. 'After all, 50% of the city consists of green spaces, which is really good for them. And there's plenty of food available, which encourages them to stay here.'

London's parakeet population has grown significantly in the last 20 years to well over 30 000. They are the only type of parrot living wild in the UK and their exotic appearance makes them stand out from other birds. They are the kind of bird you would only expect to see in a zoo in the UK. In fact, according to one theory, some originally escaped from a zoo and then went on to establish themselves around the city.

Nowadays, large numbers of parakeets are very visible in London and, while many Londoners like their bright colours, some point out that they compete with other birds for food. 'One factor that partly explains why there are so many parakeets is that London has lots of trees,' Shaw continued. 'That's where they like to live. Having said that, there are reports that they scare away other smaller birds which also depend on these trees. I haven't seen any evidence of this being a serious problem, although some people are concerned about this and want to get rid of them. In fact, there are strict laws that protect wildlife – and these regulations are partly why the birds are doing well here.'

I think of Africa and India, where these parakeets originally come from, as places with hot climates, and very different from the UK. So, the idea that the parakeet population in London is expanding puzzled me. Aren't the long, cold winters a problem for them? 'The climate here suits them, actually,' Shaw told me. 'They come from northern India near the Himalayas, where temperatures can be very low. You can also find groups of them in other northern European cities, and the idea that the first ones here flew over from France has even been suggested.'

Shaw then told me that in India and in other countries with parakeet populations, not everyone welcomes them. 'They're hungry birds and can cause considerable damage to crops,' Shaw explained. 'UK farmers are afraid this might happen here, though the birds have so far kept to London and other cities. Also, like many birds, they carry disease, which scientists have expressed concern about.'

Most people in London, however, love seeing these beautiful creatures. With so much wildlife under threat, it's encouraging to see one species doing well. And there are lots of interesting parakeet stories. One is that in 1968, the rock star Jimi Hendrix released a pair of parakeets from a cage, and that's how the local population began. No-one knows whether this really happened or not, though. Another story goes back to 1951, when some birds were brought to London to appear in a film, and then established themselves. While we can't prove that these stories are true, they reflect the interest many Londoners take in their city's parakeets.

You are going to give a talk about the parakeets of London to your class at school. Prepare some notes to use as the basis for your talk.

Make short notes under each heading.

10 Reasons for the increasing number of parakeets in London:

- *example: 50% of the city consists of green spaces*
-
-
- [3]

11 Possible explanations for how parakeets first came to be in London:

-
-
- [3]

12 Worries some people have about the parakeets:

-
-
- [3]

[Total: 9]

Exercise 4

- 13** Read the article about 'smart homes', where many electrical devices are connected to the internet and can be controlled from smartphones.

Write a summary about the advantages of living in a smart home AND the problems that can be caused by the technology in smart homes.

Your summary should be about 100 words long (and no more than 120 words long). You should use your own words as far as possible.

You will receive up to 8 marks for the content of your summary, and up to 8 marks for the style and accuracy of your language.

Smart homes

If you own a television, you will probably have a remote control that allows you to turn the television on and off, change channels and adjust the volume from across the room. You may also have a remote control for your central heating or your air-conditioning system. Remote controls like these have been a common sight in many people's homes for a long time, but, in recent years, many more 'smart devices' have been developed. Now, with a smartphone and internet connection, it is possible to control a range of household appliances from wherever you are, either inside your home or even outside it. On the other hand, the cost of installing such systems is high, which is why they are still not a feature in every household.

Imagine you have walked to a station, 15 minutes from your home, and you are about to get on a train. It suddenly occurs to you that you didn't get around to closing the kitchen window. Rather than walk all the way back and miss your train, you can save a lot of time by using an app on your phone to check, and close it for you. So your home security is also improved.

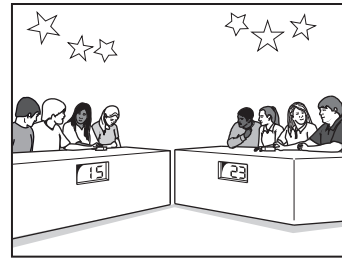
With digital set-ups of this kind, your system won't work if the internet crashes. We all know how frustrating this can be. Also, advanced electronic devices are expensive to repair. But let's assume that everything is working; studies have shown that one of the top benefits of introducing smart systems into the home is that you save energy. Smart devices can help us to avoid making mistakes like accidentally leaving our lights on for long periods of time, for example.

So, will most people's homes in the future be smart homes? That certainly seems likely: many newly built houses and apartments are fully equipped with smart technology, and many homeowners are gradually converting their older properties into smart homes.

Will different groups in the population be affected in different ways by the introduction of smart systems? Research has shown that having access to the type of technology used in smart homes allows elderly people, for example, to be more independent. While younger people might have less of a problem keeping on top of the housework or the gardening, these types of jobs can become more challenging as people get older. Smart devices can help them to continue to do these things themselves without having to rely on others. However, elderly people sometimes have difficulties dealing with change and learning how to operate smart devices may cause them anxiety. This is something that engineers and designers need to bear in mind.

Of course, one unfortunate consequence of all this new technology is that, with so many devices and appliances becoming linked to wider networks, personal information could become even more accessible to other people. This is an issue that we will have to deal with.

Exercise 5



14 Recently, you and some other students from your school took part in a quiz.

Write an email to a friend about the quiz.

In your email, you should:

- explain why you took part in the quiz
- describe how you prepared for the quiz
- say how you felt about taking part in the quiz.

The pictures above may give you some ideas, and you can also use some ideas of your own.

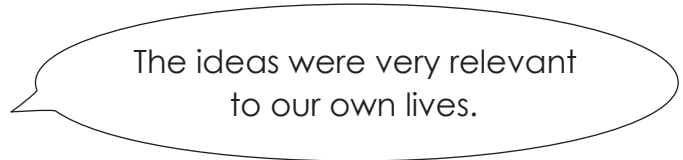
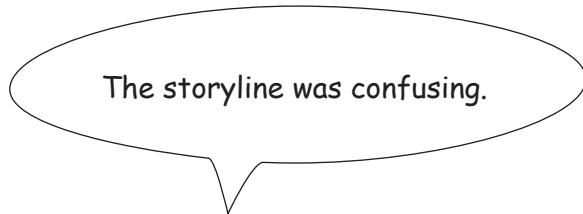
Your email should be between 150 and 200 words long.

You will receive up to 8 marks for the content of your email, and up to 8 marks for the language used.

Exercise 6

- 15** You recently watched a television drama series which a lot of young people are talking about. You have decided to write a review of the series for your school magazine.

Here are two comments made by young people about the television drama series:



Write a review for your school magazine.

The comments above may give you some ideas, and you can also use some ideas of your own.

Your review should be between 150 and 200 words long.

You will receive up to 8 marks for the content of your review, and up to 8 marks for the language used.

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