

6

Science and technology

UNIT AIMS

LISTENING SKILLS

Identifying and avoiding distractors
Matching

SPEAKING SKILLS

Part 3: Making generalizations

PRONUNCIATION

Sounding interested

EXAM LISTENING

Section 4



Topic talk

1 Look at the pictures and answer the questions below.

- What role do scientists and engineers play in the situations in the pictures?
- To which other areas of life do scientists and engineers contribute?
- What skills and qualities do you need to be a scientist or an engineer?

2 Match the branches of science (1–10) with the area each one involves (a–j).

- | | |
|---------------|---|
| 1 biology | a forces and energy in the world around us |
| 2 chemistry | b chemical elements, their compounds and how they react |
| 3 physics | c the earth's atmosphere and weather |
| 4 psychology | d the mind and its effect on behaviour |
| 5 botany | e society and how human beings behave in groups |
| 6 astronomy | f plants, animals and all living things |
| 7 sociology | g the structure and materials of the earth, e.g. rocks and minerals |
| 8 geology | h the environment and the things that live in it |
| 9 meteorology | i plants |
| 10 ecology | j the stars, planets and galaxies |

3 Do you study or you have studied any of these sciences? Do you plan to study any of them in the future?

4 Which branch of science would you describe in the following ways? Give reasons for your answers.

- a the most interesting
- b of the most practical use
- c the most difficult to study
- d of the most relevance today

5 What are the adjectives for each of the nouns in 2?

Example
biology: biological

6 How have engineers and scientists contributed to the following areas of life? Think of at least one example for each area.

- a buildings and homes
- b communication
- c food and agriculture
- d health and medicine
- e natural disasters
- f travel and transport
- g work
- h power and energy

7 Look at the list of scientific and engineering achievements (a–j). Match the achievements to the examples (1–10).

- | | |
|---------------------------------|--|
| a water supply and distribution | 1 cardiac pacemaker, kidney dialysis machine, laser surgery |
| b imaging | 2 stainless steel, nylon, carbon fibre |
| c agricultural mechanization | 3 hydraulic brakes, electronic fuel injection system, airbags |
| d household appliances | 4 the transistor, the microprocessor, the integrated circuit |
| e high-performance materials | 5 railways, light bulbs, domestic heating systems |
| f roads | 6 tractors, the internal combustion engine, the combine harvester |
| g electrification | 7 canals, desalination plants, pipes |
| h electronics | 8 radar, photography, ultrasound |
| i health technologies | 9 the washing machine, the dishwasher, the vacuum cleaner |
| j the motor car | 10 motorways, tarmac, Catseyes |

8 Number each achievement (a–j) in 7 according to how important you consider it. (1 = least important, 10 = most important).

9 Compare lists with another student. Explain the reasons for your choices.

Example

I think electronics are important because they contribute to so many other things. Without them we wouldn't have computers, mobile phones or TVs.

Listening skills

Identifying and avoiding distractors

- 1 Read the following multiple choice question and answer questions a and b.

Dan got the idea for his research from

- A a friend of his tutor's
- B a postgraduate student in his department
- C an article he read in a scientific journal

- a What are the key words in the question? Underline them.
- b Can you think of any synonyms for the key words?

- 2 Read the audio script below of part of the listening task to find the answer to 1.

- a What is the correct answer? _____
- b Underline the distractors. What information tells you that the distractors are incorrect?

Dan I've been doing some research into the popularity of engineering as a university subject and in particular the number of females choosing this subject. My main research was based on UK home students but I wanted to make a comparison with international students in the UK and with students studying engineering in other countries.

First, a little about my reasons for choosing this area of research. Well, a few months ago I was talking to a friend who studies chemistry and she mentioned that her tutor was concerned about falling admissions in their department. This got me thinking about student numbers in engineering. Soon after I noticed an editorial piece in *Science Today* which mentioned that the numbers of postgraduate engineering students had declined in recent years, although the number of female students had increased. I therefore decided to carry out my own research in this field.

Technique

A distractor is a key word used in the listening which is specifically designed to distract you and lead you to an incorrect answer.



3 Read the next question. Underline the key words and think of any synonyms.

Who was questioned in Dan's survey?

- A academic staff in his department
- B undergraduate students from other countries
- C postgraduate students studying overseas


4  2.1 Listen and answer the question in 3.

5 Did you hear any distractors? How did you know what the correct answer was? Look at the audio script or listen again and find the distractors.

Matching

Exam information

In matching tasks, you will be given a number of options to match to the questions. You will hear the questions in the same order as they are written on the question paper.

6  2.2 Listen to the final part of the talk. Which statement applies to each of the following people who were interviewed by Dan?

Choose **FOUR** answers from the box and write the correct answer, **A–F**, next to questions **1–4**.

- A disconnected in the middle of the interview
- B was annoyed by the questions
- C withheld information
- D refused to participate
- E was suspicious of Dan's motives
- F was not easy to locate

1 a postgraduate student from China

2 a female student at a foreign university

3 a male undergraduate

4 a contact of Dan's tutor

Technique

Underline the key words in the question and/or options and think of possible synonyms or paraphrases.

Speaking skills

- 1** Which word in each group does NOT collocate with the word in **bold**?
- a **scientific** breakthrough/gadget/invention/innovation
 - cutting-edge/state-of-the-art/unusual/advanced **technology**
 - a recent/scientific/current/groundbreaking **discovery**
 - a **medical** breakthrough/discovery/innovation/movement
 - pioneering/modern/medical/scientific **research**
 - a scientific/new/technological/digital **revolution**
- 2** Choose one of the noun phrases in 1 to complete the following Part 2 task card. Use the same noun phrase in each gap.

Describe (a/an) of the last twenty years which you feel has a major influence on your life.

You should say

- what the is
- when it started/happened
- what effect it had

and explain how this has influenced your life.

- 3** Spend one minute preparing and making notes. Then practise speaking for two minutes using your notes.

Exam information

The questions in Part 3 of the Speaking test are more challenging as they require you to speak about more abstract, academic topics. Part 1 questions are on more familiar or personal topics.

Part 3: Making generalizations

- 4** Read the following questions about science. Which ones are taken from Speaking Part 1 and which from Part 3?

- Which science subject at school do/did you like the most? Why? _____
- Do you think life is safer, or more dangerous, with modern technology?

- Does everybody need to know how to use a computer these days? _____
- How has your study of science helped you? _____
- Do you think new developments in science often cause more problems than they solve? _____
- Which area of scientific research do you think is most important and deserves further research and development? _____
- What science subjects do students study at school in your country? _____
- Is there anything about science that you dislike? _____
- Do you think there are some areas that should be off-limits to scientific research? _____
- What effect does new technology have on employment? _____

- 5 Read two candidates' responses to one of the questions in 1 and answer the questions below.

Candidate A

Well, I think life is more dangerous as I know many people who have had problems with crime on the Internet. I have a friend who lost some money when she was banking online. Also lots of my friends' parents are worried about them using the Internet because of online bullying and things like that.

Candidate B

In general, I would say advances in science and technology have made us more secure in many ways. Increased scientific knowledge tends to make us more aware of dangers, and developments in some areas have meant that we are more able to deal with difficulties. Health and medicine would be a good example. Of course, technology is liable to bring dangers too. Take the Internet for instance – that has brought new risks and more criminal activity..

- a Which question are they answering? _____
- b Which of the candidates provides the best answer? Why? _____
- c Underline any words or phrases that Candidate B uses to make generalizations.
- d How does Candidate B support these generalizations? _____
- 6 Read two more candidates' answers to questions in 1. Which question is each one answering? Underline any words or expressions used to make generalizations.

Candidate C

There are many worthwhile areas of research but, on the whole, I think anything that develops our knowledge and understanding of health and medicine should have further resources and investment. It often seems to be the case that this area is neglected in favour of things like space research and I don't believe that's right.

Candidate D

As a rule, most jobs would require you to have some skills in this area and I believe in many cases it's probably essential to have a good understanding as you would be expected to use them on a daily basis. Generally speaking, it's more likely to be older generations who haven't got these skills, as they didn't learn them in their younger days and they can have a tendency to be nervous about learning something new.

- 7 With a partner, ask and answer the Part 3 questions from 1. Try to make generalizations and support your answers with examples.

Technique

Answers to Part 3 questions should not be too personal, even when you are giving an opinion. You should try to make generalizations, supported by more specific examples. Avoid being too direct with personal opinions or examples from your own life but try to keep your answers more abstract.

Pronunciation

Sounding interested

- 1**  **2.3** Listen to two students responding to this Part 3 question. Which student sounds more interested? Why?

Examiner


Do you think new developments in science often cause more problems than they solve?

Candidate A

No, not really. Actually, I would say, that it's the other way round – the problems that science solves far outweigh the problems that it may bring.

Candidate B

Yes, I think so. Scientific developments often cause lots of problems so sometimes they're not worth it.

- 2**  **2.4** Look at two more responses to the same question. Listen and mark where the students' voices rise or fall.

Candidate C

Absolutely. I mean scientific development can be a positive thing but you need to remember all the negative consequences it can have.

Candidate D


Well, I suppose it can cause problems, but overall, surely scientific development is a positive thing?

- 3** Look at this question and the five candidates' responses. Mark where you think their voices will rise or fall.

Examiner

Do you think there are some areas that should be off-limits to scientific research?

- a** Absolutely. I don't think anyone should try to interfere with nature.
- b** I'm not sure really. Most research is beneficial but some can be unethical or even dangerous.
- c** I really don't think so. Scientists should be free to do what they like.
- d** It's a difficult one. If you start prohibiting some research, where do you draw the line?
- e** Of course, there should be some sort of guidelines otherwise scientists would do whatever they liked.
- f** I agree that there should be some restrictions but it's so difficult to monitor.

- 4**  **2.5** Listen and check whether your ideas were right.

- 5** Practise saying the sentences aloud paying particular attention to the stress and intonation.

Technique

Using flat intonation can show a lack of interest in the topic or examiner and can even make you sound rude. It is important that you use intonation to sound interested and friendly. A change of intonation may occur over a word or phrase or within one word, so that a word may contain a single rise or fall or one word may contain both a rise and a fall.

Technique

Don't worry too much about getting the intonation exactly right as intonation can be quite flexible. The important thing to remember is that the voice moves on the stressed words, so think about where the main stresses are in the sentence and move your voice on these.

Exam listening

Section 4

2.6

Questions 31–34

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

- 31** The number pi
- A is usually approximated to three decimal points
 - B is an infinite number
 - C can be shown as an exact fraction
- 32** The date of World Pi Day
- A is July 22nd
 - B is a fraction shown as a date
 - C is a decimal shown as a date
- 33** The Ancient Babylonians
- A discovered an imprecise value of pi
 - B calculated pi as exactly 3
 - C used pi to calculate building size
- 34** The Ancient Egyptian document mentioned
- A is the first written record of pi
 - B gives an accurate value of pi
 - C is a reproduction of a previous one

2.7

Questions 35–40

Which statement applies to each of the following people?

Choose **SIX** answers from the box and write the correct letter, **A–I**, next to questions 35–40.

- | |
|---|
| <p>A had a formula named after him</p> <p>B made a mistake</p> <p>C proposed a name for the ratio</p> <p>D proved the irrationality of pi</p> <p>E used a calculator to calculate pi</p> <p>F holds the world record for calculating the most digits of pi</p> <p>G used shapes to calculate pi</p> <p>H achieved a feat of memory</p> <p>I proved the transcendence of pi</p> |
|---|

- 35** A Greek academic
- 36** A British mathematician
- 37** A German mathematician
- 38** An amateur mathematician
- 39** A French computer programmer
- 40** A postgraduate student