BRITISH COUNCIL

Advanced Space 84

Life on Mars

Lesson description

In this lesson you will take part in a selection panel to choose the best candidates to colonise Mars. You will listen to a scientist talking about a project to colonise Mars. You will discuss its feasibility in terms of potential problems and solutions. You will look at idioms to do with difficulties, lexical items with 'of', and passive reporting verbs.

Aim

Participate in a discussion to make a decision.

Language

- Idioms to do with difficulties.
- Lexical items with 'of'.
- Passive reporting verbs.

Task

The task is for learners to join a selection committee to discuss and rank candidates in terms of their suitability to take part in a project to colonise Mars.

Materials

Images or trailer of Mars project.

Audio 84.1 and 84.2.

Audioscript (for *Language focus* exercise 2, optional).

Handout.

Photocopiable (candidate profiles for *Task*, one set of cards per pair).

Suggested running order

Lead-in	Students do a 'dictoflash' exercise and discuss going to Mars.
Input	Students listen to a short talk on colonising Mars.
Language focus	Students work with idioms to do with difficulties and problems. They look at and practise nouns commonly followed by 'of'. Then they practise using passive reporting verbs.
Task	Students work in pairs to discuss and rank candidates in terms of their suitability to take part in a mission to Mars. Pairs then compare their ideas in groups.

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Lead-in

1 Display a montage of the Mars One project or show a short trailer from Youtube, e.g. *The Mars 100 - Mars One Astronaut Selection Round Three Trailer*. Elicit students' ideas and comments. Then tell them you are going to display a short summary of the project. Tell them they have a minute to view it and their task is to jot down key words and phrases. They then work with a partner and flesh out their notes into a complete text. Then get them to compare with the original and check for any non-standard English.

> Mars One is a project that is privately funded and aims to colonise the red planet by 2027. By 2020 they hope to send a robot spacecraft there followed closely by equipment and supplies. They are in the process of considering applications for the four man crew that will launch in 2026 on a 200-day journey to our neighbouring planet. As soon as the colony is established another four people will be sent every two years.

2 Students discuss the questions about the project to colonise Mars with their partner. Feedback as appropriate.

Input

1 Tell the students they are going to listen to a talk about colonising Mars and the problems involved. They should look at the topics in pairs and predict which might be the biggest problems and think of solutions.

2 ▶ 84.1 Play the audio. Students take notes then compare their ideas with what they heard.

3 Students match the 'solutions' to the problems in 1, and discuss what's involved.

Answers

big rockets = take-off (bigger rockets needed because of the distance to travel)

inflatable heat shields = landing (to slow down for landing because of very heavy spacecraft)

'space nuts'= funding (tens of billions of dollars needed)

electrolysis = oxygen (electrolysis to extract oxygen from the carbon dioxide rich atmosphere on mars, but very small scale)

recycling equipment = water (from urine and sweat, but very small amounts and technology is problematic; water on the planet would need to be accessed)

minerals & additives = food (add minerals and additives to the rock to be able to grow food)

nuclear batteries = power (also fuel cells and solar panels so power not a problem)

strict hierarchy = government (initially needed to avoid tyranny and later ensure democracy)

inflatable domes = housing (initial solution, then houses can be built with rock to protect from radiation)

4 ▶ 84.1 Play the audio again for students to check.

5 Students say if they think any of the problems will not be resolved.

Language focus

1 Ask students if they noticed any expressions for talking about problems and difficulties. They then try to complete the extracts from the audio in pairs.

2 ▶ 84.2 Students listen and check.

Answers

1 *unmitigated disaster.*
2 *go pear-shaped.*
3 *stumbling block*
4 *goes without a hitch*
5 *having teething problems*
6 *a thorny issue*
7 *in a tight spot.*
8 *bitten off more than we can chew.*

Check meaning, use and pronunciation as appropriate.

Suggested answers

go pear-shaped = of a plan which goes wrong or has an undesirable effect

an unmitigated disaster = a complete failure

a stumbling block = a problem that prevents you achieving something

to go without a hitch = to go as planned

to have teething problems = to have difficulties in the initial stages of an activity

a thorny issue = a difficult or unpleasant problem

to be in a tight spot = to be in a difficult situation

to bite off more than you can chew = to try to do something too difficult for you

If there is time, give out the transcript and students hunt for other expressions to do with problems and difficulties.

Answers

could be tricky, the problem of landing, a major engineering challenge, another potential obstacle, less of a problem, an ongoing problem, a fundamental problem.

3 Students tell their partners briefly about something that presented problems. You could give a brief model first using some of the target language.

4 Tell them that *of* is one of the commonest words and often used to connect nouns. See if they can match the two halves of the phrases from the audio.

Answers

1 *a piece of cake*
2 *levels of radiation*
3 *chances of bringing up future Martian babies*
4 *the problem of landing*
5 *tens of billions of dollars*
6 *a fraction of what would be needed*
7 *the dangers of a space colony turning into a tyranny*
8 *some kind of democracy*
9 *a process of changing the planet*
10 *a population of at least 2000*

5 Tell them that 10 examples of *of* to connect nouns have been removed from the text about Mars. Students work in pairs to replace them.

Answers

In terms of *distance, Mars is the fourth planet from the sun. It is rocky and cold with polar caps* of *frozen water. It is named after the Roman god* of *war because it is a red planet, the colour* of *blood. The planet Mars has a crust* of *rock. The ground is red as a result* of *carbon dioxide and a tiny amount* of *oxygen. It does not have any liquid water on the surface but signs* of *run-off on the surface* of *Mars were probably caused by water. The average thickness* of *the planet's crust is about 50km.*

6 Students read and discuss the questions in the language box.

Answers

Form: It is / was + past participle = a passive construction with the impersonal it.

Function: used for reporting general perceptions in a formal way.

You could elicit or feed in a few more, e.g. *calculate, consider, discover, expect, feel, hope, report, say, show, understand, etc.*

7 Get students to generate sentences about space using the sentence starters, e.g. *It is claimed in children's stories that the moon is made of cheese.*

Task

1 Tell the students that they are going to take part in a selection panel to choose the best candidates to take part in the mission to Mars. Ask them to read the information and check they understand the task. Emphasise that they will need to choose people with the best skills and they will also need to be balanced psychologically to withstand the conditions.

2 Put them in pairs and distribute the cards describing the candidates. Tell them they have to consider each person in turn and then rank them in terms of their suitability to join the mission. They must be able to explain their decision.

3 Pairs join another pair and discuss their ordering and thinking behind it. They should now reach a group decision about the final order.

4 Report back to the class. Feedback on language and review the learning objectives.

Audio script

84.1

So why leave Earth? And why head to Mars? The answer is simple – our whole species is under threat. You know an asteroid was just six hours away from full impact in the late 1990's! And leading scientists claim that space is the only hope for our long-term survival from extinction – from nuclear war or fatal disease or other unmitigated disaster. So, actually projects like Mars One see the red planet as an ideal second home. I mean, the days are similar in length to ours. There's frozen water and the soil resembles what you find in our own deserts. But it won't be a piece of cake.

Just getting there could be tricky – a nine-month journey which could go pear-shaped. It could be uncomfortable, risky and dull and will require rockets far bigger than anything built before. Not only that, the crew will be exposed to dangerous levels of radiation. It seems unavoidable and could harm their chances of bringing up future Martian babies.

Anyway, then there's the problem of landing. The spacecraft alone could weigh over ten tonnes and that's without the service module or landing rockets. It's actually a major engineering challenge – but which might be overcome with giant inflatable heat shields to slow their approach.

Another potential stumbling block is the expense involved – thought to be tens of billions of dollars – although it is hoped that billionaire 'space nuts' may foot the bill. We shall see.

Right, assuming the flight goes without a hitch, then once landed, the crew will need oxygen, water, food and power if they're to survive in the long term. Agencies are experimenting with electrolysis to extract oxygen from the carbon dioxide rich Martian atmosphere but this is very much on the small scale.

Similarly, there's recycling equipment available to get water from urine and sweat, but clearly this is a fraction of what would be needed to supply a colony and they're having teething problems with the technology involved. There's evidence that there's water on Mars at the ice caps and under the surface which would need to be accessed.

OK, a big challenge would be growing food on Mars. Edible greens have been produced in desert research stations, but nothing appetising as yet. So, one option is to cultivate the local rock as a medium by adding minerals and additives.

Anyway, less of a thorny issue is power. Fuel cells and nuclear batteries could be augmented by solar panels. That's not a problem.

Well, any extra-terrestrial community will need to establish a government. Initially, this will almost certainly need to be quite strictly hierarchical. I mean, some scientists have warned of the dangers of a space colony turning into a tyranny. For example, if someone gets hold of the oxygen supply it would leave you in a tight spot. But eventually some kind of democracy will need to be formed with an economy, employment, social care, etc.

Right, then they reckon that the first settlers will live in capsules – inflatable domes. But at some point it would make sense to excavate the local rock for building materials which at the very least could be used to shield the settlers from radiation which you know is an ongoing problem.

Well, some scientists talk of terraforming Mars, a process of changing the planet from a suffocating, sterile environment into a green and pleasant land with an oxygen filled atmosphere. OK, a fundamental problem with this is that Earth's atmosphere is contained within a magnetic field, the magnetosphere that Mars totally lacks.

So, if the colony is to survive, the settlers will need to have children – if they haven't been made infertile through exposure to cosmic radiation. For this, it's estimated that a population of at least 2,000 would be needed to avoid in-breeding and so on. All in all, we might have bitten off more than we can chew.

Audio script

84.2 (excerpts from 84.1)

1 Leading scientists claim that space is the only hope for our long-term survival from extinction – from nuclear war or fatal disease or other unmitigated disaster.

2 Just getting there could be tricky – a nine-month journey which could go pear-shaped.

3 Another potential stumbling block is the expense involved.

4 Right, assuming the flight goes without a hitch, then once landed, the crew will need oxygen, water, food and power if they are to survive in the long term.

5 They're having teething problems with the technology involved.

6 Anyway, less of a thorny issue is power.

7 For example, if someone gets hold of the oxygen supply, it would leave you in a tight spot.

8 All in all, we might have bitten off more than we can chew.