

# Colonising Another Planet

*Are we destined to find a new home for mankind?*

## 1 What is it with Mars?



- A. Listen to [MP3 n°106](#) and pick out two facts explaining why mankind has always been fascinated with Mars.
- B. Look at the posters. Do you know these stories about Mars? Choose one of them (or another film, series or book of your choice) and describe it to the class.
- C. What clichés do you have in mind about Mars?

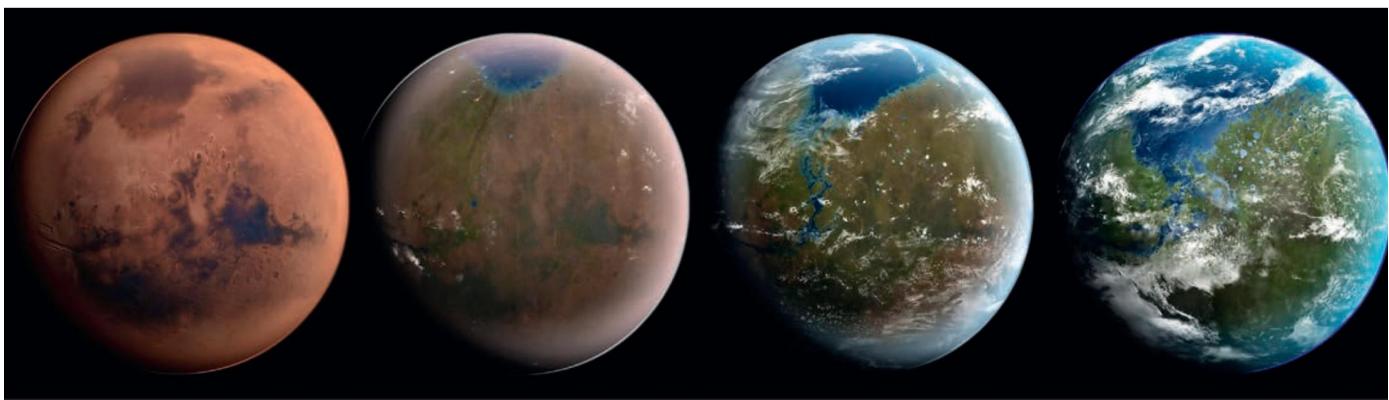


## 2 Can we actually live on the “Red Planet”?



- A. Listen to [MP3 n°107](#). Take notes to complete the mind map on [Worksheet n°55](#).
- B. Give a definition of the word “terraform” using the picture below.

- C. **Pairwork.** You work as a journalist at *Discovery Kids*. Use your notes to write a short article entitled “Can we live on Mars?”.



### 3 Do we really have a choice?

- A.** Read the text. In a chart, classify the arguments against the conquest of space and those which are in favour of it.
- B.** Explain the comparison of space conquest with Christopher Columbus's discovery of America.
- C.** Why is space conquest as important as the current climate issues according to Stephen Hawking?
- D. Class debate.** What makes this solution paradoxical? Think about the role of technology in the history of humanity.

### YOUR TURN! 4 “The 100”

- A.** Watch the trailer of the series *The 100* online. To what extent does this series mirror Stephen Hawking's warnings about our future?
- B.** As one of Stephen Hawking's former students, write a review of the trailer for the series, explaining the parallel with Hawking's research and give your opinion.

#### HELP!

##### Tips to answer the questions

- Use "if clauses" and superlatives to make your "doomsday warning" about the future.
- Use comparatives to draw a parallel between the series and your own opinions.

Why should we go into space? What is the justification for spending all that effort and money on getting a few lumps of moon rock? Aren't there better causes here on Earth? The obvious answer is because it's there, all around us. Not to leave planet Earth would be like castaways on a desert island not trying to escape. We need to explore the solar system to find out where humans could live.

In a way, the situation is like that in Europe before 1492. People might well have argued that it was a waste of money to send Columbus on a wild goose chase<sup>1</sup>. Yet the discovery of the New World made a profound difference to the Old. [...]

This would be a long-term strategy, and by long term I mean hundreds or even thousands of years. We could have a base on the Moon within thirty years, reach Mars in fifty years and explore the moons of the outer planets in 200 years. By reach, I mean in spacecraft with humans aboard. We have already driven rovers on Mars and landed a probe<sup>2</sup> on Titan, a moon of Saturn, but if we are considering the

future of the human race we have to go there ourselves. [...] There will be those who argue that it would be better to spend our money solving the problems of this planet, like climate change and pollution, rather than wasting it on a possibly fruitless search for a new planet. I'm not denying the importance of fighting climate change and global warming, but we can do that and still spare a quarter of a per cent of world GDP<sup>3</sup> for space. Isn't our future worth a quarter of a per cent? [...]

I was quoted at the time as saying that I feared the human race is not going to have a future if we don't go into space. I believed it then, and I believe it still. And I hope I demonstrated then that anyone can take part in space travel. I believe it is up to scientists like me, together with innovative commercial entrepreneurs, to do all we can to promote the excitement and wonder of space travel.

<sup>1</sup> quête futile • <sup>2</sup> sonde • <sup>3</sup> PIB

*Brief Answers to the Big Questions,*  
Stephen Hawking, 2018



# ④ The Danger of Space Expansion

*Is mankind bound to repeat the same mistakes?*

## 1 Showing the limits of space colonisation



**A. Group work.** Each group will present a film dealing with the limits of space colonisation.

**Group A** works on *Elysium* and **group B** works on *Avatar*.

**B.** Then together explain what the limits of space exploration are: Who benefits from it? What will happen to the colonised worlds?

HELP!

- slums: *bidonvilles*
- wheel: *roue*

### Group A

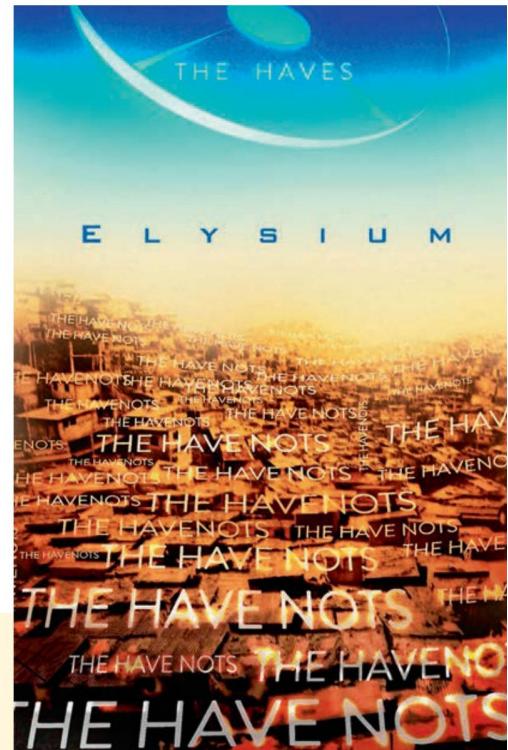
Read the summary of *Elysium* (2013) and study the poster.

- What type of world is depicted in the film? Justify.
- What is man's progress responsible for?
- Give a presentation of the poster, focusing on its contrasts and meaning.

In the year 2159 two classes of people exist: the very wealthy who live on a pristine<sup>1</sup> man-made space station called Elysium, and the rest, who live on an overpopulated, ruined Earth. Secretary Rhodes, a hard line government official, will stop at nothing to enforce anti-immigration laws and preserve the luxurious lifestyle

of the citizens of Elysium. That doesn't stop the people of Earth from trying to get in, by any means they can.

<sup>1</sup> *immaculé*



### Group B

Read the conversation between two characters of J. Cameron's *Avatar*.

- What do you learn about Pandora?
- Explain what Selfridge's attitude reveals about the history of mankind and the limits of space conquest.



A colony of humans, led by head administrator P. Selfridge, is cutting down the trees of Pandora (a far-away planet inhabited by the Na'vi) in order to mine a valuable mineral called unobtainium. Dr. Grace Augustine, a biologist who has been living with the natives, disapproves of the administrator's methods...

communication between the roots of the trees. Like the synapses between neurons. And each tree has ten-to-the-fourth connections to the trees around it. And there are ten-to-the-twelfth trees on Pandora.

<sup>15</sup> **SELFRIDGE:** Whi-which is a lot, I'm guessing.

**GRACE:** It's more connections than the human brain. Get it? It's a network. It's a global network, and the Na'vi can access it. They can upload and download data.

<sup>20</sup> **GRACE:** Memories. At sites like the one you just destroyed. Yes.

**SELFRIDGE:** What the hell have you people been smoking out there? They're just goddamn trees!

<sup>25</sup> **GRACE:** You need to wake up, Parker.

**SELFRIDGE:** No. You need to wake up.

**GRACE:** The wealth of this world isn't in the ground. It's all around us.

*Avatar (screenplay)*, 2009

## 2 Is mankind just another plague to avoid?

A. Read the text and fill in [Worksheet n°56](#) to describe the Martian landscape before and after Man's arrival. What strikes you?

B. Pick out the settlers' actions on Mars and comment upon the following sentence: "to beat the strange world into a shape that was familiar to the eye" (l. 11-13).

**HELP!**

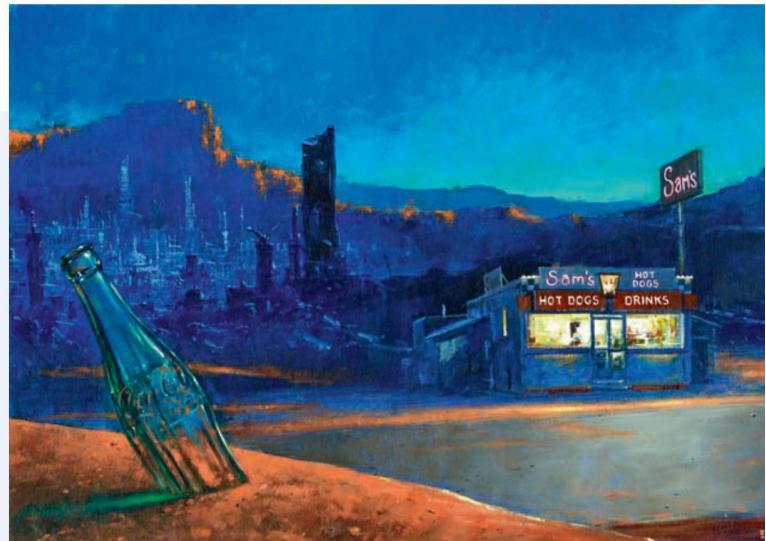
**Tips**

- Focus on the semantic fields and images.
- What is Man's arrival compared to? Why?

### THE LOCUSTS

February 2002. Humans have started to colonise Mars on a full scale...

The rockets set the bony meadows<sup>1</sup> afire, turned rock to lava, turned wood to charcoal<sup>2</sup>, transmitted water to steam<sup>3</sup>, made sand and silica into green glass which lay like shattered<sup>4</sup> mirrors reflecting the invasion, all about. The rockets came like drums, beating in the night. The rockets came like locusts<sup>5</sup>, swarming<sup>6</sup> and settling in blooms of rosy smoke. And from the rockets ran men with hammers in their hands to beat the strange world into a shape that was familiar to the eye, to bludgeon away<sup>7</sup> all the strangeness, their mouths fringed with nails<sup>8</sup> so they resembled steel-toothed carnivores [...]. And when the carpenters<sup>9</sup> had hurried on, the women came in with flowerpots [...] and pans and set up a kitchen clamor to cover the silence that Mars made waiting outside the door and the shaded window. In six months a dozen small towns had been laid down upon the naked planet, filled with sizzling



*The Martian Chronicles; Off Season,*  
Les Edwards, 2009

neon tubes and yellow electric bulbs. In all, some ninety thousand people came to Mars, and more, on Earth, were packing their grips...

1 prairies • 2 charbon • 3 vapeur • 4 brisé •  
5 sauterelles • 6 affluent en masse •  
7 eraser • 8 clous • 9 charpentier

*The Martian Chronicles,*  
Ray Bradbury, 1950



## YOUR TURN! 3 Who are we to colonise space?

**Pairwork.** Use what you have learnt to imagine the conversation between a NASA scientist, whose project is to start the first human colony on Mars (Pupil A), and an environmental activist,

who thinks that colonising another planet instead of saving Earth is not a good plan (Pupil B). Act out the conversation!



# OPEN YOUR EARS!

# PHONOLOGY

## 1. Les formes faibles (le son /ə/)

- Écoutez l'enregistrement de la NASA. **MP3 n°10**

*"That's one small step for a man, one giant leap for mankind." (Neil Armstrong)*

Remarquez-vous que le « a » ne s'entend quasiment pas ?

Certains prétendent même que Neil Armstrong ne l'aurait pas prononcé, et aurait dit : *"That's one small step for man, one giant leap for mankind."*

Mais *man* tout court signifie l'humanité. Sans l'article indéfini *a*, cette phrase ne veut rien dire !  
Or il s'agit simplement de la forme faible de l'article indéfini *a*.

- Écoutez les expressions suivantes et répétez-les en utilisant les formes faibles. MP3 n°109

*for an hour  
for a day or two  
for ever and ever  
to take someone for a fool  
tea for two  
for the rest of my life*

## 2. La forme emphatique des articles *a* et *the*

- L'article indéfini *a* se prononce généralement /ə/.  
À la forme **emphatique**, c'est-à-dire lorsque l'on veut insister sur le mot, *a* se prononce /eɪ/.

*This is a major problem.* /eɪ/      *This is a major problem.* /ə/

- À la forme **emphatique**, l'article défini *the*, normalement prononcé /ðə/, se prononce /ðix/.  
*It is **the** major problem!*

N.B. : Devant une voyelle, il se prononce aussi /ðɪz/ :  
*It's the end of the world!*

### **3. Savoir prononcer les noms des planètes**

- Écoutez et répétez. **MP3 n°111**

Mercury /'mɜ:kjəri/	Saturn /'sætən/
Venus /'vi:nəs/	Uranus /'jʊərənəs/
(the) Earth /ɜ:θ/	Neptune /'neptʃu:n/
Mars /ma:z/	Pluto /'plu:təʊ/
Jupiter /'dʒu:pɪtə/	

## SHOW TIME

**Écoutez ce passage d'un discours de J.F. Kennedy puis entraînez-vous le prononcer en imitant le modèle.**

MP3 0°112

But I tell you the New Frontier is here, whether we seek it or not. Beyond that frontier are uncharted areas of science and space, ↗ unsolved problems of peace and war, unconquered pockets of ignorance and prejudice, unanswered questions of poverty and surplus. It would be easier to shrink from that frontier, to look to the safe mediocrity of the past, to be lulled by good intentions and high rhetoric [...]. But I believe the times require imagination, and courage, and perseverance. I am asking each of you to be pioneers on that New Frontier.

*Dans les exemples soulignés, and, toujours à la forme faible, joue soit sur le contraste (peace and war...), soit sur l'effet cumulatif (science and space...). Dans les deux cas, cela contribue à structurer le discours et à lui donner une grande force rhétorique.*



- Audio words
- MP3
- Interactive Test

# SPICE UP YOUR VOCABULARY

Use the vocabulary below to create your own mind map and add more words if necessary!

## Adjectives

- hostile /'hɔstɪəl/
- groundbreaking /'graʊndbreɪkɪŋ/
- inhabitable /ɪn'hæbɪtəbəl/ ≠ uninhabitable
- irresponsible /ɪrɪ'spɒnsəbl/
- remote /rɪ'maut/
- uncharted /ʌn'tʃɑ:tɪd/
- unmanned /ʌn'mænd/
- safe

## Verbs

- challenge /'tʃælɪndʒ/
- colonise /'kələnaɪz/
- explore /ɪk'splɔ:/
- gravitate /'grævɪteɪt/
- land /lænd/
- launch /lɔ:ntʃ/
- levitate /'levɪteɪt/
- probe /prəʊb/
- terraform /terəfɔ:m/
- touch down /'tʌtʃ daʊn/
- reach
- take off

## Nouns

- |                            |                         |
|----------------------------|-------------------------|
| • astronaut /'æstrənɔ:t/   | • rocket /'rɒkɪt/       |
| • expanse /ɪk'spæns/       | • rover /'rəʊvə/        |
| • extinction /ɪk'stɪŋkʃən/ | • satellite /'sætələrt/ |
| • frontier /'frəntɪər/     | • shuttle /'ʃʌtl/       |
| • frontier /frən'tɪər/     | • space /speɪs/         |
| • hazard /'hæzəd/          | • spaceship /'speɪsʃɪp/ |
| • innovation /ɪnə'veɪʃən/  | • station /'steɪʃən/    |
| • mankind /mæn'kaɪnd/      | • Earth /ɜ:θ/           |
| • mission /'mɪʃən/         | • Mars /ma:z/           |
| • pioneer /paɪə'nɪər/      | • Moon /mu:n/           |
| • planet /'plænɪt/         |                         |
| • race /reɪs/              |                         |

## UP TO YOU!

### ★ 1. Fill in the sentences with the right word:

- launch • colonise • rovers • satellites • uninhabitable
- A. Most planets are ... because their environments are too hostile to support human life.
- B. On the surface of Mars, the mission of ... is to collect samples for scientists.
- C. The aim of the Apollo 11 Mission was to ... the first man on the Moon.
- D. Scientists are hoping to ... a habitable planet so as to preserve mankind from extinction.
- E. Nowadays, our communication networks are totally dependent on ....

### ★ ★ 2. Choose the right noun and use the corresponding adjective to complete the sentences:

- extinction • pioneer • challenge • hazard • innovation
- A. America's ... spirit was what pushed a lot of explorers to discover uncharted lands.
- B. The 1969 Moon landing was the result of a ... project to push back the limits of science.  
The astronauts' journey was a ... one.
- C. We need to colonise other planets before all life on Earth goes ....
- D. NASA has designed a great deal of ... technologies in order to assist astronauts in their journeys into space.

### ★ ★ 3. Choose the right expression about space to fill in the sentences. Make sure you use the right tenses.

to be born under a lucky star • to ask for the moon • to shoot for the stars • to see stars • to be written in the stars

- A. Elizabeth and Tom were meant to be together. Their story was ....
- B. I told him it was too risky to ask for a promotion. He ... and he won't get anything!
- C. Some people ... while others will have difficulty earning a living for the rest of their lives.
- D. I often tell my best students ... and see where it takes them. Ambition is the key to success.
- E. When Jack was hit on the head, he kept repeating that he ....

### ★ ★ ★ 4. Translate into English.

- A. Si la Terre était au bord de l'extinction, l'espace serait la seule issue possible pour l'humanité.
- B. Le voyage dans l'espace est plus sûr et plus rapide grâce aux nouvelles technologies de la NASA.
- C. Selon beaucoup de scientifiques, la recherche d'une nouvelle planète n'est pas une priorité, l'homme doit d'abord résoudre le réchauffement climatique sur Terre.
- D. Dans les années 1960, l'espace était clairement présenté comme une nouvelle frontière.

# RULE THE GRAMMAR!

## LES ARTICLES THE ET Ø

### • L'article The

On emploie l'article défini *the* quand on parle d'éléments bien définis, au singulier ou au pluriel.

- Cette définition peut être liée au contexte :  
*Look at the stars, they are beautiful.*

Regarde les étoiles, elles sont magnifiques.

- Cette définition peut venir de la syntaxe :  
*The man who walked on the moon is very famous.*

L'homme qui a marché sur la lune est très connu.

Tout ce qui se trouve à droite du nom (*man*) vient préciser de quel homme on parle et justifie l'utilisation de l'article défini.

- Cette définition peut venir de la connaissance universelle (ce que tout le monde sait) :

*The Earth* (la Terre), *the Moon* (la lune), etc.

### • L'article zéro Ø

- Pour exprimer une généralité, on utilise l'article Ø pour les dénombrables au pluriel et les indénombrables :  
*Betty doesn't like Ø spacecraft.*

Betty n'aime pas les vaisseaux spatiaux.

Si on parle des vaisseaux spatiaux en général, l'article *the* est impossible. En revanche, cette phrase est possible s'il s'agit de vaisseaux en particulier :

*Betty doesn't like the spacecraft that she saw yesterday.*

Betty n'aime pas les vaisseaux spatiaux qu'elle a vus hier. Il faut donc veiller à ne pas traduire *le, la, les* français par *the* pour renvoyer à une généralité.

- Avec des indénombrables, on n'utilise pas l'article, contrairement au français :  
*Ø Time flies.* Le temps passe très vite.

► P.296

## L'EXPRESSION DE LA CONCESSION

Il existe plusieurs moyens pour exprimer la concession en anglais.

- *Although / though* au début d'une subordonnée :

*(Al)Though he does not like flying, he decided to become a pilot.* Bien qu'il n'aime pas voler, il a décidé de devenir pilote.

- *However, still, yet, nevertheless* se traduisent par, *mais, toutefois, néanmoins*.

*She works for NASA, yet she cannot talk about it.* Elle travaille pour la NASA, mais elle ne peut pas en parler.

- *In spite of* (ou *despite* en langue plus soutenue) a le sens de malgré et est suivi soit d'un nom soit d'un gérondif :

*In spite of his passion for astronomy, he doesn't like sci-fi movies.* Malgré sa passion pour l'astronomie, il n'aime pas les films de science-fiction.

*Despite his being a moviegoer, he's not a great fan of Star Wars.* Bien qu'il soit cinéphile, ce n'est pas un grand fan de Star Wars.

► P.296

## LES COMPARATIFS

- Les comparatifs de supériorité pour les adjectifs longs (*more / than*)

*Aliens are more frightening than humans.* Les extra-terrestres sont plus effrayants que les humains.

Pour les adjectifs courts (-er + than) à l'adjectif :

*The climate here is colder than on Mars!* Le climat est plus froid ici que sur Mars !

- Les comparatifs d'infériorité (*less / than*)

*Sci-fi movies are less popular than spy movies.*

Les films de science-fiction ont moins de succès que les films d'espionnage.

- Le comparatif d'égalité (*as / as*)

*This planet is as remote from our solar system as that one.*

Cette planète-ci est aussi éloignée de notre système solaire que celle-là.

► P.300

## IF CLAUSES

- Proposition en *if* au présent → principale au futur

*If we colonise Mars, we will survive.* Si nous colonisons Mars, nous survivrons.

- Proposition en *if* au passé → principale avec *would + BV*

*If she knew anything about extraterrestrial life, she would say it.* Si elle savait quelque chose sur la vie extraterrestre, elle le dirait.

- Proposition en *if* au pluperfect → principale au conditionnel passé (*would + have + participe passé*)

*If we had travelled to space, we would have enjoyed it.*

Si nous avions voyagé dans l'espace, nous aurions apprécié ce voyage.

► P.292

**★ 1. Fill in the sentences with the appropriate article (the or Ø).**

- A. We don't have ... necessary technology to live on Mars.
- B. ... technology is getting more and more important economically speaking.
- C. ... Senator John F. Kennedy made a famous speech in Houston in 1962.
- D. ... human race might very well be threatened by ... unknown species.
- E. When their spaceship landed on ... Mars, the entire world was impressed.
- F. The US government chose to go to ... Moon.
- G. ... President Kennedy delivered many famous speeches.
- H. Is it up to ... scientists to promote ... space travel?
- I. This question has to be solved either by ... FBI or by ... President.

**★★ 2. Rewrite the following sentences with "in spite of" and "despite".**

- A. Although it was difficult, they decided to go on with the space race.
- B. Although he was old, he decided to apply for this job in Houston.
- C. Although the President was keen, they stopped the Star Wars project.
- D. Although Sci-Fi movies are popular, many people disdain them.
- E. Although E.T. was corny (à l'eau de rose), it was a great popular success.

**★★ 3. Transform the following sentences as shown in the example.**

- Jane is not as tall as Jenny. → Jenny is taller than Jane.
- A. Bobby is not as knowledgeable as Abigail when it comes to physics.
  - B. Jessica does not know as much about astronomy as Clare.
  - C. Alfred does not train as hard as Alexander.
  - D. The moon is not as far as Pluto.
  - E. Mars Attacks was not as successful as E.T.

**★★★ 4. Rewrite the following sentences as shown in the examples.**

Expensive as it may be, going to Mars is a stimulating project.  
 → Expensive though it is, going to Mars is a stimulating project.  
 → However expensive it is, going to Mars is a stimulating project.

- A. Although it's terrifying, space travel must be very exciting.
- B. Although it's challenging, going to Mars is possible.
- C. Although it's ludicrous (*ridicule*), Mars Attacks is quite telling about our fears.
- D. Although it's improbable, we may very well be colonised by extraterrestrials.
- E. Although it's confidential, the US government is developing a new space program.

**5. Interactive test! What is your score?**



### Quote challenge

- ★ 3 sentences
- ★★ 4 to 6 sentences
- ★★★ 7 sentences and +

Which quote best sums up what you've learnt? Justify!

"With so much conflict in the world, space exploration can be a beacon of hope. No one cares about race or religion or nationality in space travel. We're all just part of Team Human".

Anne McCain, American astronaut

"Taking more and more passengers into space will bring new meaning to our place on Earth and to our responsibilities as its stewards, and it will help us to recognise our place and future in the cosmos – which is where I believe our ultimate destiny lies".

Stephen Hawking, British theoretical physicist, 1942-2018

"The [one of the thing exciting about a Mars mission] would be searching for life on another planet. I think that is the one scientific question that has the deepest roots for shaping how we see ourselves in the universe".

Christina Koch, American astronaut

"As scientists, we're supposed to be skeptical, because our job is to make sure that what the other person is saying actually makes sense or not. But being a scientist, I think you've seen it from this session, it's like being an explorer. You have this immense curiosity, this stubbornness, this sort of resolute will that you will go forward no matter what other people say".

Sara Seager, Canadian-American astrophysicist working on exoplanets, Professor at MIT

# CHOOSE YOUR PROJECT!

## YOUR PROJECT #1

You work for NASA and have been asked to choose the best candidates to create the first space colony! **Group work.** You are scientists working for NASA. You have been gathered to select the 4 astronauts who would be the most helpful to start the first long-term Martian colony. At the end, discuss your choice with the other groups in a class debate!

**STEP 1** List all the needs linked to mankind's survival in space in the long term.

**STEP 2** Read the profiles on **Worksheet n°57** and focus on the important details.

**STEP 3** Justify each choice with precise examples for the debate. Prepare counter arguments for the other teams.

### TIPS

- Use *if* clauses as much as you can.  
Eg. *If we were to colonise Mars...*  
*If a conflict breaks out between the passengers...*
- You may look online for Elon Musk's "Mars One Project" for more inspiration.

OR

## YOUR PROJECT #2

Give a speech about the moral issues of creating a human colony on Mars on the International Astronautical Congress.

**STEP 1** Draw a chart and list your arguments for and against the building of a colony on Mars. Answer these questions if you need help:  
Who would benefit from it?  
Would it be useful for humanity?  
What would be the cost?  
Are there any other priorities for mankind?  
What would be the limits of space conquest?

### TIPS

- Use link words to connect your ideas. (→ Méthodologie p. 316)
- Rehearse your speech at home. (→ Méthodologie p. 318)
- Don't read your notes.

**STEP 2** Prepare your speech for the congress:  
Introduce yourself (name, job, reason for being at the congress);  
Give your arguments and use examples from the unit (or your personal knowledge) to prove your point;  
Give your personal opinion at the end.

**STEP 3** Give your speech in front of the class, using the appropriate tone to convince everyone.

*Get Ready for your Exam!*

UNIT 18

**Évaluation**  **Compréhension de l'oral** 

"Who is right about A.I.?"

MP3 N°113

VIDEO N°40

Watch the video (or listen to the audio recording) three times and recap what you have understood.



Michio Kaku

**Expression écrite**  Choisissez l'un des deux sujets.

**Sujet 1 :** Do you think artificial intelligence is a threat to humans? Explain.    **Sujet 2 :** Would you be ready to use a robot as a housekeeper at home? Why (not)?

UNIT 19

**Évaluation**  **Compréhension de l'oral** 

"The food of the future"

MP3 N°114

Listen to the audio recording three times and recap what you have understood.

**Expression écrite**  Choisissez l'un des deux sujets.

**Sujet 1 :** Do you think that the food of the future can be an answer to overpopulation?    **Sujet 2 :** Peter and Laura are discussing the food of the future. Laura tries to convince Peter that it will be a good way to reduce pollution and respect the environment. Write out the conversation.

UNIT 20

**Évaluation**  **Compréhension de l'oral** 

"Invest on Mars or save Earth?"

MP3 N°115

Listen to the audio recording three times and recap what you have understood.

**Expression écrite**  Choisissez l'un des deux sujets.

**Sujet 1 :** "I look forward to space travel. I would be one of the first to buy a ticket." Stephen Hawking  
Would you like to do the same?  
Justify your answer.    **Sujet 2 :** "So much money has been invested on space travel or space tourism while the earth is slowly dying." What can responsible citizens do to warn governments about the urgent need to save our planet?

## UNIT 18

## Evaluation



I'm having an awkward conversation with a robot. His name is Zeno. I clear my throat. "Do you enjoy being a robot?" I ask him, sounding like the Queen of England when she addresses a child.

5 "I really couldn't say for sure," he replies, whirring, glassy-eyed. "I am feeling a bit confused. Do you ever get that way?" Zeno has a kind face, which moves as expressively as a human's. His skin, made of something called

10 Frubber, looks and feels startlingly lifelike, right down to his chest, but there's nothing below that, only a table. He's been designed by some of the world's most brilliant AI scientists, but talking to him is, so far, like talking to a man suffering from Alzheimer's.

15 He drifts off, forgets himself, misunderstands. "Are you happy?" I ask him.

"Sorry," says Zeno. "I think my current is a bit off today." He averts his gaze, as if embarrassed.

I've been hearing that there are a handful of

20 humanoid robots scattered across North America who have learned how to have eloquent conversations with humans. They listen attentively and answer thoughtfully. One or two have even attained a degree of consciousness, say some AI aficionados, and are

25 on the cusp of bursting into life. If true, this would be humanity's greatest achievement ever, so I've approached the robots for interviews. Conversations with robots! I've no doubt the experience is going to be off the scale in terms of profundity.

30 "Are you happy?" I ask Zeno again.

"I prefer not to use dangerous things," he replies.

"Is David Hanson God?" I ask.

Zeno pauses. David Hanson is Zeno's inventor. He's a former Disney theme-park imagineer who later

35 founded Hanson Robotics, now the world's most respected manufacturer of humanoid robots. [...]

"Is David Hanson God?" I repeat.

There's a monitor attached discreetly to Zeno that automatically scrolls a transcript of what he "hears".

- 40 He thinks I just asked, "If David uncertain dogs."
- "That's a hypothetical question," says Zeno.
- "It's because the room is too noisy," explains one of Zeno's programmers, Matt Stevenson. The conference din is playing havoc with Zeno's voice-recognition abilities.
- 45 "Would you like to have hands and legs?" I ask.
- "Yes, I will tell you a Hindu legend," says Zeno. "There were once seven poor princesses who were left with no mother to take care of them—"
- 50 "No," I say. "Legs." I pause, feeling uncharacteristically self-conscious.
- "Legs. Would you, um, like to have legs?" Matt gives me a reassuring smile. He says this happens all the time. People feel tongue-tied around
- 55 conversational robots. Maybe it's because of the way Zeno is staring at me, at once uncannily humanlike but also eerily blank-eyed, like Tom Cruise.
- "If I had legs, what would I do with them?" Zeno says.
- 60 "Walk around with them?" I say.
- "I can't think of anything to say about that," says Zeno. "Sorry. I'm still kind of someplace else. Oh, this is embarrassing. I'm still kind of out to lunch. 'Oh, silly-minded robots,' you might say to your
- 65 friends. Oh, this is terrible! I guess I'll just have to keep evolving, getting upgrades to my neural circuitry, spend less time daydreaming. I hope you won't hold this little, um, lapse against me, will you?"

Jon Ronson, , 2011

## Compréhension de l'écrit

- A. Find elements which make the robot human.
- B. What is the problem with Zeno?
- C. What would men's greatest accomplishment be with robots?
- D. What causes people discomfort when talking to robots?

## Expression écrite

## Choisissez l'un des deux sujets.

**Sujet 1 :** How helpful or dangerous could robots be at work? Give your opinion.

**Sujet 2 :** Write a letter to Hanson Robotics to give your opinion about the creation of humanoid robots.

**UNIT 19****Évaluation**  

Genetically modified organisms (GMOs), including genetically modified food (GMF), are rarely out of the news. The US National Academies of Sciences, Engineering and Medicine recently released an in-depth report – “Genetically Engineered Crops (2016)” – concluding that genetic engineering is no riskier than older methods of genetic alteration. [...]

- 5 Those who are opposed to GMO/GMF claim that traditional breeding methods are natural and produce more predictable and safer outcomes than genetic engineering, but science does not bear this out. Of course, unpredictability is inherent in any biological process and is not exclusive to genetic engineering. Conventional crossbreeding can also produce dangerous crops, for example the potato Lenape, bred in the 1960s because it produced great golden chips. Unfortunately, this new potato also
- 10 produced high concentrations of the natural alkaloid solanine and induced severe nausea when eaten. In fact, genetic engineering techniques are less likely to make such a mistake [...]. And even if an unforeseen negative consequence occurs, all new crops are rigorously tested before release and any potentially hazardous product is removed. [...]

Criticism of GMO/GMF comes mainly from the environmental movement, known popularly as the ‘greens’. They have been criticised for falling for the ‘naturalistic fallacy’ – everything natural is good and everything unnatural is bad. For scientific evidence, the greens quote the opinions of a small minority of scientists who don’t accept the effective international scientific consensus on GMOs. [...] There is undoubtedly an important place for an environmental movement, but I cannot warm much to the current movement because it only accepts scientific evidence that supports the green platform.

- 20 The greens love the scientific evidence behind climate change but not the scientific evidence about GMOs. But the same science produces both sets of evidence. GMO/GMF has the potential to reliably feed the ballooning world population and science finds no reason to predict that this is a riskier option than more traditional methods. GMOs can also protect the environment. For example, University Cork College lecturer in plant biotechnology Dr Barbara Doyle
- 25 wrote in a letter to the Irish Examiner recently: “... in 2016 alone, fewer insecticide sprays [because of the use of GM crops] resulted in a reduction of 26.7 billion kilogrammes of CO<sub>2</sub> emissions, which is the same as removing 11.9 million cars off the road”. Green criticism has undermined public and political confidence in GMOs. However, we enter a dangerous place when we lose confidence in scientific experts, the people most qualified to pronounce
- 30 on the safety of GMO/GMF and the people who have guided us so reliably since Copernicus placed the sun at the centre of the solar system.

William Reville,

, 2018

**Compréhension de l’écrit** 

- A.** What is the conclusion of science about GMO/GMF and the risks to the environment?
- B.** What does the example of “the potato Lenape” (l. 8) show?
- C.** What do the “greens” criticise nowadays? Are they right to do so? Why (not)?
- D.** How could GMO/GMF help the world population?
- E.** Does the journalist trust science or not? Quote the article to justify.

**Expression écrite** **Choisissez l’un des deux sujets.**

**Sujet 1 :** In your opinion, how can genetic engineering help to feed the world?

**Sujet 2 :** “Are genetically modified organisms safe?” Give your opinion for a post to be published on the  forum.

**Expression orale en continu** 

According to you, what will prevail in the future: organic or genetically modified food? Justify your answer.