

6 New Horizons

- 1 What do you see? What do you think is happening in this photo?
- 2 What kinds of new discoveries do you think will be made in the future?
- 3 Flip through the unit quickly. What new possibilities will you be learning about in this unit? Which one looks most interesting to you?

Unit Outcomes

In this unit, you will learn to:

- make predictions using different future forms
- identify key words used to explain reasons
- describe skills needed to achieve future goals
- develop and write a counterargument





32° 51.97' 74° 45.76' 18
32° 52.31' 74° 45.72' 18
32° 52.29' 74° 45.49' 18
30° 48.26' 73° 35.12' 18
30° 47.90' 73° 38.29' 18
30° 47.95' 73° 38.32' 18





Vocabulary

cutting-edge the most advanced or most exciting in a particular field

efficient able to do tasks successfully, without wasting time or energy

feasible possible

interact (with) to communicate as you work or spend time together with others

obsolete no longer necessary because something better has been invented

primitive simple; not well developed

take (something) for granted accept that something is true or normal without thinking about it

versatile able to be used for many different purposes

A What technologies did not exist a hundred years ago that we now take for granted? How have these things transformed people's lives? What would life be like without them? Discuss your answers with a partner.

B Look at the photos and describe what you see. Then use the vocabulary from the list to complete the profile below. Work with a partner.

ROBOT REVOLUTION

Robots are being created that can think,

(1) _____ with people, and even relate to people. Though humanlike robots are still fairly primitive, it's

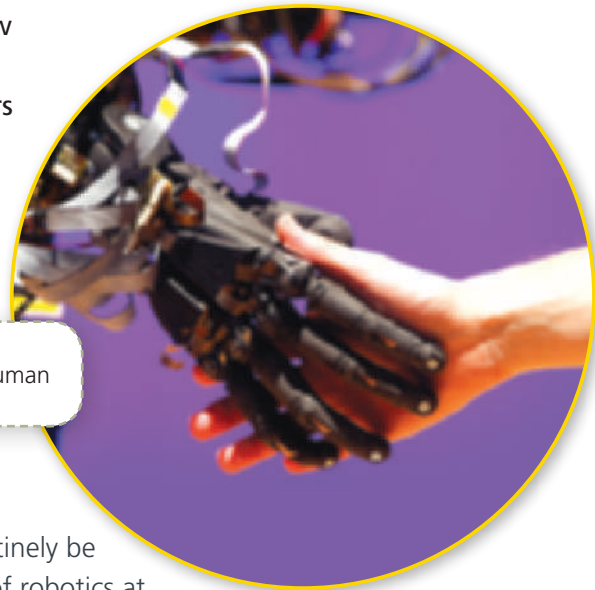
(2) _____ that "in five or ten years androids will routinely be functioning in human environments," says Reid Simmons, a professor of robotics at Carnegie Mellon University. These versatile and (3) _____ machines will cook for us, wash and fold the laundry, and even care for and teach our children while we watch from a computer miles away. Though such technology now seems innovative, by 2100, say scientists, we'll (4) _____ it _____, just like we do driving a car or making a phone call. Other ways that robots might transform our lives:

- Robotic autocars will drive for us, which will make the roads safer.
- Microscopic medical "nanobots" will repair old cells and cure diseases, increasing our lives by hundreds of years.
- Flying drones will deliver packages and pizzas right to our doors, making delivery people (5) _____.

Types of robots

android a robot that looks human

drone a robotic flying device



This robot mimics human gestures, such as shaking hands.

C Do you think that using robots will make our lives better? Why or why not? What might be some of the positive and negative consequences? Discuss your answers with a partner.



This drone has a camera and can be used by police.

Grammar

A Study the chart and answer the questions below with a partner.



Predictions with Future Forms	
future continuous: Use to show that an event will be ongoing in the future.	<i>will/be going to + be + present participle</i> ① In five or ten years, robots will be functioning in human environments.
future perfect: Use to show that a future event will be finished by some future point in time.	<i>will + have + past participle</i> ② By 2020, scientists believe that we will have found a cure for certain types of cancer.
future in the past: Use to talk in present time about a prediction that was made in the past.	<i>would or was/were going to + base form of the verb</i> Carlos thought getting a job after graduation would be hard, but he was hired by a company right away.
① It would also be correct to use the simple future or <i>be going to</i> here. Notice though that the simple future states that an action will or won't happen. The future continuous emphasizes the duration or ongoing status of the action. ② This sentence means that at some point before 2020, scientists will discover a cure for cancer. It would also be possible to say here, <i>We will find a cure for cancer by 2020.</i>	

Which form do we use to talk about . . .

- an ongoing event in the future?
- a prediction that was made previously?
- an event that will be finished at some point in the future?

B Complete the sentences using the correct future form of the verb in parentheses. Sometimes more than one answer is possible. Check your answers with a partner.



- Over the next decade, more women (enter) _____ the workplace, and many more companies (hire) _____ female managers and CEOs.
- By the end of the twenty-first century, experts believe we (exhaust) _____ all major oil reserves.
- In 1900, an American magazine predicted that Russian (be) _____ the second most widely-spoken language in the world after English.
- Experts believe almost 70% of the world's people (live) _____ in cities by 2050.
- Futurist Magazine* predicts that by 2021, commercial space travel (become) _____ very popular and that more than thirteen thousand people (travel) _____ into space.
- In the late 1960s, artist Andy Warhol said that one day, everyone (have) _____ a chance to be famous for fifteen minutes. Thanks to the Internet, his prediction has come true.

C Make your own prediction about society, fashion, travel, education, work, or another topic, and write it on the board. Then read your classmates' ideas. Which predictions seem feasible? Which don't? Why? Tell a partner.



Ask

Answer

Look at the past predictions in Exercise B. Can you think of any other predictions that people made in the past that did or didn't come true?

Listening

- A** At a recent press conference, an aviation expert answered questions about the future of air travel. Read the questions below. Do you think the expert will answer *yes* or *no*? Why? Tell a partner.

- _____ Will we someday commute to work in flying cars?
 _____ In the future, will commercial airliners fly faster than they do now?
 _____ Is it possible that we'll ever use jet packs to get around?

- B** Which question is the expert answering? Listen and write the correct number (1, 2, or 3) next to each question in Exercise A.

- C** How did the expert actually respond to each question? Read the Listening Strategy. Then listen again and circle *yes* or *no*. Fill in the notes on the reasons he gives for each response.

Listening Strategy

Signal Phrases As you listen, pay attention to how the speaker uses these signal phrases to explain his reasons: *For a couple of reasons . . .*; *One of the main reasons is . . .*; *There are good reasons why . . .*; *Keep in mind, too, that . . .*; *Another important reason is that . . .* When you hear these used, be prepared to take notes on what the speaker says. As you're taking notes, try to list only key words (nouns, verbs, adjectives, numbers), not every word.



Man in flight using a jet pack

Question	Response	Reasons
1	yes / no	a. The cost of _____: the more you use, the more _____ a flight is. b. Traveling at _____ speeds isn't _____; the plane can _____ in the air.
2	yes / no	a. An accident would almost always be _____. b. Most models that we have now aren't _____. You can't switch from _____ to _____.
3	yes / no	a. _____ b. _____

- D** Look back at the reasons you wrote in Exercise C and answer the following questions about the expert's comments with a partner.

- Which forms of air transportation did people in the past predict we'd have by now?
- Which one does the expert believe we'll be using in the future? What are some of the current challenges of using this form of transportation?
- Were you surprised by any of the expert's answers? Why or why not?

Connections

A Read the predictions below about the workplace. Then answer Questions 1–3 with a partner. When you're done, list your ideas to Questions 2 and 3 on the board.

1. Which items are already common where you live?
2. Can you think of other skills that people will need in the future?
3. What are some things you can do to get the skills needed to succeed in the workplace?

Scientists prepare an experiment using fiber optic cables.

Today's Workplace . . . and Tomorrow's

- People will be changing jobs more often. Fewer people will be staying with one company in the same position for life. Many more people will be freelancing or starting their own businesses.
- People will need to be versatile and efficient—not just good at one thing, but skilled in many different areas.
- Innovative critical thinkers with problem-solving skills will be in demand.
- The ability to interact effectively with others will continue to be in demand, as many more people will be expected to work in teams to get jobs done.
- Those who are fluent in English and at least one other language will be favored over monolingual speakers.
- Your prediction: _____

B On your own, write your answers to the questions below on a separate piece of paper.

1. What is your current occupation? If you are a student, what are you studying?
2. What are some of your short- and long-term career goals? For example, what do you expect you'll be doing a year from now? How about five years from now?
3. How do you plan to accomplish those goals?
4. Do you feel that you have the skills necessary to be successful in tomorrow's workplace? Why or why not? If not, what are you planning to do to improve your skill set?

C Get together with a partner and take turns asking and answering the questions in Exercise B. What do you think of your partner's plans? What other suggestions can you give?

What are some of your short- and long-term career goals?

A year from now, I'll be applying to graduate school. Five years from now, I will have taken my company public.

D Repeat Exercise C with two other partners. Then share the most helpful piece of advice you got with the rest of the class.

Reading



Did you know?

Earth's atmosphere . . .

- provides us with the oxygen we need to breathe.
- protects us from the sun's harmful rays.
- keeps our planet warm enough for plants to grow and for oceans, rivers, and seas to form.

atmosphere layer of air or gas around a planet

habitable good enough for people to live in

A How much do you know about the planet Mars? Work with a partner and mark each statement *True* or *False*. Use your dictionary to help you understand the words in bold.



1. Scientists believe there was once a lot of water on the surface of Mars. That water is now **frozen** in the planet's **polar** regions.
2. Mars isn't a habitable planet for humans. It's too cold, and it has a very **thin** atmosphere.
3. There is less **gravity** on Mars than there is on Earth.
4. Mars is often called the "red planet" because its **soil** is red.

B Read the article's title and subtitle, and look at the image on page 67. How would you answer the questions in the subtitle? Discuss your ideas with a partner. Then read the article to check your ideas.



C How might humans transform Mars into a habitable planet? Match a time from the Thousand-Year Project with an event.

- a. Every eighteen months
 - b. In the first one hundred years
 - c. By the year 200
 - d. By the year 600
 - e. By the year 1,000
1. _____ humans will be able to grow trees and other plants.
 2. _____ humans will have started living in cities.
 3. _____ an atmosphere starts to form as humans release CO₂ into the air.
 4. _____ humans will travel to Mars; each new group will set up new buildings.
 5. _____ water will have begun to flow and Mars's surface will have started to change.



Exploration on Mars

D Robert Zubrin gives two reasons for transforming Mars into a habitable planet. On a separate piece of paper, list the reasons and their benefits. Then compare answers with a partner.



Ask

Answer

Do you think making Mars the new Earth is really feasible? Is it a good idea? Why or why not?

Making Mars the New Earth

What would it take to green¹ the red planet, and should we do it?



- 1 Could we transform Mars's frozen surface into something more friendly and Earthlike? And if we could, the question is: Should we? The first question has a clear answer: Yes, we probably could. Spacecraft exploring Mars have found evidence that the planet was warm in its youth and had rivers and large seas. Scientists believe that we could return Mars to this state by adding greenhouse gases like carbon dioxide into the planet's air. This would help create an atmosphere, which in turn would warm the planet, melt polar ice, and allow water to flow.
- 10 Transforming Mars into a habitable planet for humans could take centuries, but many supporters of the idea believe the effort would be worth it. Aerospace engineer Robert Zubrin, for example, believes that there are at least two good reasons to do it. The first is that going to Mars will challenge us, especially our youth. From this project, we could get millions of new scientists, doctors, inventors, and engineers. Zubrin also believes that if we open Mars to humanity, we will have a place for our species to grow and evolve, which will help to ensure humans' long-term survival. Zubrin anticipates that years from now there will be hundreds of colonies on Mars. Because
- 20 the gravity of Mars is less than on Earth, humans living there would eventually become lighter, taller, and slimmer. Earth people, by comparison, would appear a bit short and heavy. What we would have, says Zubrin, is species divergence.² In biology, he explains, a species is considered successful if it has many different types. Socially and culturally, humans would also evolve. Zubrin says Mars will be settled by different groups of people who want to live where the rules haven't been created yet. As a result, the inhabitants of Mars will likely develop a new way of life with unique languages, customs, literature, and technology.
- 30 Ultimately, manned missions to Mars would not only benefit people here on Earth, but also help to ensure humans' long-term survival. And for these reasons, say Zubrin and others, the journey and the expense would be worth it.

¹ **green** to make habitable for plant and animal life

² **divergence** separating; drawing apart

The **THOUSAND-YEAR** Project

Year 0: The project begins with a series of eighteen-month survey missions. Each crew making the six-month journey to Mars adds new housing and other buildings to the site.

Year 100: An atmosphere starts to form as humans add greenhouse gases like CO₂ into the planet's air.

Year 200: The temperature of the planet is now warmer. Rain starts to fall and water begins to flow. Mars's red soil begins to green very slightly.

Year 600: Small rivers and lakes have formed. There is now enough oxygen in the soil and atmosphere to grow flowers and plants.

Year 1,000: There are now a number of human colonies on Mars. Some people are living in cities. Though the planet is now warmer and greener, humans can still only go outside wearing breathing equipment. It will be thousands of years before there is enough oxygen outside for humans to move around without breathing equipment.

Writing

Make a Counterargument

A Read the first two paragraphs of this essay and then discuss Questions 1–3 with a partner.



Robert Zubrin feels that sending humans to Mars to transform it into a habitable planet is a good idea. Though he has some good reasons why we should do it, the disadvantages outweigh the benefits for three main reasons.

The first drawback is the enormous risk and uncertainty of the project. Zubrin says that going to Mars will challenge us and help us produce millions of skilled workers. **However**, it's difficult to justify spending lots of money on a project where the chances of success are so uncertain. We know very little about living on Mars. Failure is actually quite feasible. If the mission is not successful, those millions of jobs will not come as expected. To truly challenge ourselves, we should start by using the money to research real problems we face right here on Earth, such as cancer or poverty.

1. Is the writer agreeing with or disagreeing with Robert Zubrin?
2. What reason does the writer give for her opinion?
3. Do you think she makes a good argument against Zubrin? Why or why not?

B Zubrin gives two more reasons why we should develop colonies on Mars. You want to argue against his ideas. Read items 2 and 3 below. Then match a drawback from the box with each of Zubrin's reasons or think of your own. Explain your reasons to a partner.



1. It will produce millions of new scientists, doctors, etc.

Drawback: the risk and uncertainty

2. It will ensure humans' long-term survival.

Drawback: _____

3. Humans will have the opportunity to create a new world with new rules.

Drawback: _____

Possible Drawbacks

- We have problems to deal with on Earth first.
- Living in a place with no laws could be dangerous.
- Humans on Mars would face serious health risks.
- other: _____

C Write two more paragraphs for the essay in Exercise A on a separate piece of paper. Base these paragraphs on the drawbacks you listed in Exercise B.

1. First, read the Writing Strategy. Then for each paragraph, outline your ideas by doing the following: (1) state the drawback (*The second drawback is. . .*); (2) state Zubrin's point (*Zubrin says going to Mars will ensure. . .*); (3) offer your counterargument and clearly explain your reason (*However, . . .*).
2. Use your outline to write paragraphs 3 and 4.

Writing Strategy

Making a Counterargument

A counterargument, or rebuttal, argues against someone else's opinion, either because it is incorrect or because you have another point of view. A counterargument states:

- The opinion you disagree with: *Zubrin says that going to Mars will challenge us and help us produce millions of skilled workers.*
- Your opinion and reason for disagreeing: *However, it's difficult to justify spending lots of money on a project where the chances of success are so uncertain.*

Note that a rebuttal is often introduced using words like *however*, *yet*, and *that said*.

- D** Exchange papers with a partner, and read his or her paragraphs. Do you think your partner makes good counterarguments against Zubrin? Why or why not?

Speaking

- A** Read the questions below and think about your answers. You will need to support each of your responses with reasons and/or examples. Take some notes on a separate piece of paper.

1. In general, do you think space exploration is useful? Why or why not? Explain your answer.
2. Many people have said that given the chance, they would volunteer for a one-way journey to Mars to colonize the planet. If you were given that opportunity, would you do it? Why?
3. Every year, scientists discover more planets. Some say that it's feasible that by 2100 we will have made contact with other life forms. Does this make you feel hopeful or worried? Why?

- B** Work with a partner. Take turns answering the questions using your notes. You will have twenty minutes total. Continue until you have both answered each of the questions or time is up.

1. **Student A:** Choose one question (1–3) from Exercise **A** and answer it. Talk for one minute.

Student B: When your partner is finished, answer these questions and share your feedback with Student A:

- Did Student A keep talking without stopping or hesitating a lot?
 - Did Student A explain his or her ideas in detail and make sense when he/she talked?
2. Switch roles and repeat steps 1 and 2 until all questions are answered.

- C** Share your answers with the class. Which were the most common? Do the results surprise you?

Video

inspire to encourage or make someone want to do something

- A** Read the information about three National Geographic explorers. Have you ever heard of these people? What do these three explorers have in common? Tell a partner.



Johan Reinhard

ALEXANDRA COUSTEAU

Environmental advocate (and granddaughter of Jacques Cousteau) who raises awareness about global water issues and inspires people to protect the planet's waters

JOHAN REINHARD

Anthropologist who has done extensive field research in the Andes and Himalayas investigating the cultural practices of mountain people

SYLVIA EARLE

Oceanographer who has led numerous underwater expeditions around the world, researching marine ecosystems and advocating for the environment

- B** Read these questions. Next, watch the video of Alexandra Cousteau and write the numbers (1–2) of the questions she answers. Then watch the video of Johan Reinhard and Sylvia Earle and do the same.

1. When you were young, what inspired your interest in exploration?
2. What is the most exciting part of your job?

(Segment 1): Alexandra Cousteau _____

(Segment 2): Johan Reinhard _____

(Segment 3): Sylvia Earle _____

- C** Read the excerpts from the video below. Then watch the video again and paraphrase each underlined word or expression with a partner. Write on a separate piece of paper and use your dictionary to help you.

1. **Cousteau:** Every new place is always a revelation.
2. **Reinhard:** Probably the things that most excited me for discoveries weren't so much the mummies per se, but . . .

3. **Earle:** It's finding, not just new things, but new ideas to begin to connect the dots.

- D** Join another pair and choose one side of the following question: *Which kind of exploration is more important: ocean exploration or archeological exploration?* Pairs should not choose the same side of the debate. Carefully plan your argument and then debate your position against the other pair.



Sylvia Earle

Expanding Your Fluency

It is the year 2200. You and your classmates are colonists on your way to Mars. Though humans have been going to Mars for several years, the life you'll lead will still be fairly primitive:

- You'll be living in a small house, which you will share with four other people. You'll be spending a lot of time inside, as it will only be about 32°F (0°C) outside during the day.
- You won't have running water, and personal electricity use will be limited to one hour a day. Entertainment that you took for granted on Earth (movies, music, games) won't exist on Mars.
- Once a year, you will receive food, clothing, and medical supplies from Earth, but for the most part, you will need to grow all of your own food and repair everything you own.

Other facts:

- There are already fifty other small colonies on the planet populated by adults and children. Some are friendly and open, while others are closed and hostile to outsiders.
- People speak different languages.
- Once a month, colonies trade goods and interact with each other at indoor marketplaces.



Read the information above. Then get into a group of five people and do the following:

1. Each person should choose a role: architect, environmentalist, interpreter, nurse, engineer android, or another role of your choosing. On your own, think about these questions:
 - What skills or talents do you bring to the group?
 - How will you be able to improve the quality of life for yourself and your fellow colonists?
 - What job(s) will you be able to do?
2. Explain your answers to your partners; they will ask you questions to learn more.
3. Once on Mars, your group discovers that you have only enough resources to support four colonists. Because of this, one of you must leave the colony. Each person in the group will have one minute to explain why he or she should stay and why the others should leave.
4. Which person would you vote out of the colony? State who you chose to "vote off" and explain your reasons. The person who receives the most votes must go.

Check What You Know

Rank how well you can perform these outcomes on a scale of 1–5 (5 being the best).

- _____ make predictions using different future forms
- _____ identify key words used to explain reasons
- _____ describe skills needed to achieve future goals
- _____ develop and write a counterargument