



Austrian BASE jumper Felix Baumgartner jumps from the edge of space, 39 km (24 mi.) above the surface of the Earth.

“We really need to show people the world in a different light, in a new format—something that they can engage with and be excited about.”

—Corey Jaskolski

# Why We Explore

1. In the photo, we see a man jump from the edge of space and then free-fall, attached only to a helium balloon. Would you try this? Why or why not?
2. Why do you think people explore? What can be learned from exploring new places?
3. Where would you like to explore? Explain.

**1 Why do we explore?** Discuss. Then listen and read. **TR: 57**



The desire for **knowledge** about our world pushes explorers into the smallest caves, the deepest oceans, and even outer space. People have been exploring for centuries. But any explorer will tell you that the more they **investigate**, the more they realize there's still so much to learn.

Explorer Sylvia Earle is a deep-ocean **pioneer** with a long list of achievements. She has engaged in 7,000 hours of underwater study and written nearly 200 scientific articles on her findings. In 1970, she and a team of women “aquanuts” were required to live underwater for weeks at a time to **research** marine life. The fact that so much of the ocean remains undiscovered **has driven** Sylvia's work. In fact, even though explorers have been studying the world's oceans for years, they've only seen about five percent of them! Sylvia's **purpose** in life has been to protect the sea, and she encourages others to do so as well.

Paleoanthropologist Lee Berger has been searching for ancient hominids in **remote** parts of Africa for over two decades. He is **curious** about the family of primates that evolved into *Homo sapiens*, or human beings. Lee has made some **exciting**

discoveries over time, but his most important discovery came in 2014 when he led an expedition at the Rising Star cave system, near Johannesburg, South Africa. To explore one of the caves, researchers had to squeeze through an opening less than 25 cm (10 in.) wide. Lee wasn't small enough to do it himself, so he gathered an **expert** team of female researchers who made it inside. There they found over 1,550 bones, representing at least 15 individuals.

The bones were brought to the lab where skeletons were assembled. Lee used 3D scanning to identify an entirely new hominid species: *Homo naledi*. Creating the skeleton was just the first step in understanding the new species. “The discoveries we're now making show that in some ways, the age of exploration is still just beginning,” says Lee.

Engineer and inventor Corey Jaskolski not only explores, but also creates **high-tech** tools that allow people to **look into** the past without harming its artifacts. Corey wants explorers to protect what they **encounter** so that future generations can learn from them, too. “When we discover things, we have a responsibility to preserve them as well,” he says.

Scientists working inside the Rising Star cave, where fossils of *Homo naledi* were discovered.

**2 Learn new words.** Listen and repeat. **TR: 58**

**3 Work in pairs.** Why do you think each explorer's contributions are important? How does an explorer's work matter to all of us?

**4 Read and write the words from the list.** Make any necessary changes.

curious	drive	encounter	exciting	expert
high-tech	investigate	knowledge	purpose	remote

Corey Jaskolski is an \_\_\_\_\_ engineer and inventor whose \_\_\_\_\_ inventions are helping explorers—and ordinary people—to see the world in a different way. For example, his underwater robotic cameras can get high-resolution photos of very \_\_\_\_\_ parts of the ocean. These devices were used to \_\_\_\_\_ and film the *Titanic* shipwreck. Corey has also developed 360-degree viewers for the \_\_\_\_\_ of allowing people to explore \_\_\_\_\_ places, such as King Tut’s tomb, just by moving their mobile devices! Corey also has created night-vision cameras and 3D camera traps that help photographers capture images of animals without disturbing them. Conservation is what \_\_\_\_\_ much of Corey’s work. His equipment can be used to gain \_\_\_\_\_ about places or animals without harming them at all. Corey wants to protect what’s here on Earth so that future generations can enjoy exploring just like he does.



**5 Learn new words.** Listen for these words and match them to the definitions. Then listen and repeat. **TR: 59 and 60**

achievement	to encourage	to engage in	to require
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- \_\_\_\_\_ 1. to help or support someone
- \_\_\_\_\_ 2. to make someone do something
- \_\_\_\_\_ 3. to be involved in a cause
- \_\_\_\_\_ 4. success

**6 Choose an activity.**

1. **Work independently.** How well do you know your community? Investigate your area. Explore both online and “in the field.” Share your experience with the class.
2. **Work in pairs.** How might technology help in making new discoveries? Make a list of five ideas. Present your list to the class.
3. **Work in groups.** Investigate Corey’s work. Which of his inventions would you like to own? What would you do with it?

**SPEAKING STRATEGY TR: 61**

**Hesitating or buying time when answering questions**

Where do you see yourself in 5 years?	Hmm . . . that’s tough. I’d like to be studying in South America, but I might need to get a job.
What made you want to learn Cantonese?	Well, it’s hard to explain. I guess I’ve just always wanted to travel to Guangzhou.
Why do you think humans explore?	That’s a good question. Let me think about that one for a minute.

**7 Listen.** How does the speaker buy time before responding to the question? Write the phrases you hear. **TR: 62**

**8 Read and complete the dialogue.**

Caleb: So Kenji, how do you like living in Canada?  
 Kenji: \_\_\_\_\_ I guess I’m enjoying my experience over all, but there have been some challenges.  
 Caleb: What’s been the biggest challenge?  
 Kenji: \_\_\_\_\_ . . . probably speaking English all the time and trying to make friends.  
 Caleb: But joining the baseball team has made you pretty popular. We’re number one in the league for the first time! How’d you get so good at it?  
 Kenji: \_\_\_\_\_ In Japan, I’m just a normal player. We practice a lot. All year in fact. Don’t you do the same with hockey?  
 Caleb: Some people do, but I just play for fun. Besides I like playing baseball in spring.  
 Kenji: Would you like to visit Japan someday?  
 Caleb: \_\_\_\_\_ it’d be fun, but it sounds like I better get serious about baseball first!

**9 Work in pairs.** Cut out the cards on p. 165. Take turns asking each other the questions on the cards. Use the phrases above to buy time when necessary.

Hmm . . . that’s a good question. I’d really like to go to Borneo.

**10 Work in groups.** Write five original questions to ask your group. Then take turns asking and answering your questions.

What is your favorite book?  
 Hmm . . . that’s a tough one. Let me think about that.

If you could go anywhere in the world, where would you go?

**Go to p. 165.**

**GRAMMAR** TR: 63

**Narrative tenses: Telling a story**

Barrington Irving **had been preparing** to become a pilot since he was 15.

He **found** a manufacturer to build an airplane from donated parts that he **had received**.

On the day of the flight, he **was** ready, but he **was feeling** a little nervous.

Finally, Barrington **set off** on his historic flight. He **flew** around the world in 97 days and set a world record.

**11 Listen.** Answer the questions below using the narrative tenses. TR: 64

1. What happened when Barrington met a Jamaican pilot?

\_\_\_\_\_

2. What career had Barrington been preparing for?

\_\_\_\_\_

3. How did he start learning to fly?

\_\_\_\_\_

4. What had he been offered? Did he accept the offer?

\_\_\_\_\_

5. What was Barrington doing before his first solo flight?

\_\_\_\_\_

6. How was his first solo flight?

\_\_\_\_\_

**12 Read.** Underline the narrative tenses in the paragraph.

**13 Write.** Reread the prompt from Activity 12. Write your own response using the narrative tenses. Then share your response in a group.

**Prompt:** Tell about a time when you achieved something important. What did you achieve? How had you been preparing?

Once I climbed a mountain that was over 3,000 m (10,000 ft.) tall. I had been training with my dad all spring to get ready. We had been practicing on smaller mountains. To climb the mountain, we were using special equipment like ice picks and thick ropes. After we had reached the top, it felt great to look down on the forest below us. I later climbed three other mountains with my dad, and we plan to do another next month.

**14 Learn new words.** Listen to the story of Barrington's first solo flight around the world. Then listen and repeat. TR: 65 and 66



This map shows the **route** that Barrington flew. His plane was in **motion** for most of his 97-day trip around the **globe**.

Barrington **set a record** as a pilot. Now he works to **educate** students in math and science.

**15 Work in pairs.** Read the interview questions and fill in the blanks with the correct words from the box. Then answer the questions as if you were Barrington. Use the narrative tenses.

globe   motion   pilot   route   set a record

1. Q: How had playing video games prepared you to become a \_\_\_\_\_ ?

A: \_\_\_\_\_

2. Q: How were you able to get an airplane to fly around the \_\_\_\_\_ ?

A: \_\_\_\_\_

3. Q: How many stops were on your \_\_\_\_\_ ?

A: \_\_\_\_\_

4. Q: What were you doing to stay awake while in \_\_\_\_\_ for so many hours?

A: \_\_\_\_\_

5. Q: How did you feel when you heard you had \_\_\_\_\_ ?

A: \_\_\_\_\_

**16 Work independently.** Investigate another person who has explored new places. Write a narrative about the explorer's route, experiences, and accomplishments. Share what you learned with the class.

# THE Explorer GENE

## Are we born to explore?

Of all the animals on Earth, none are so driven to explore as humans. Other animals will go in search of food or water. But humans can be motivated simply by the possibility of discovery. So what is it exactly that caused us to spread out across the globe 60,000 years ago, instead of just staying in Africa?

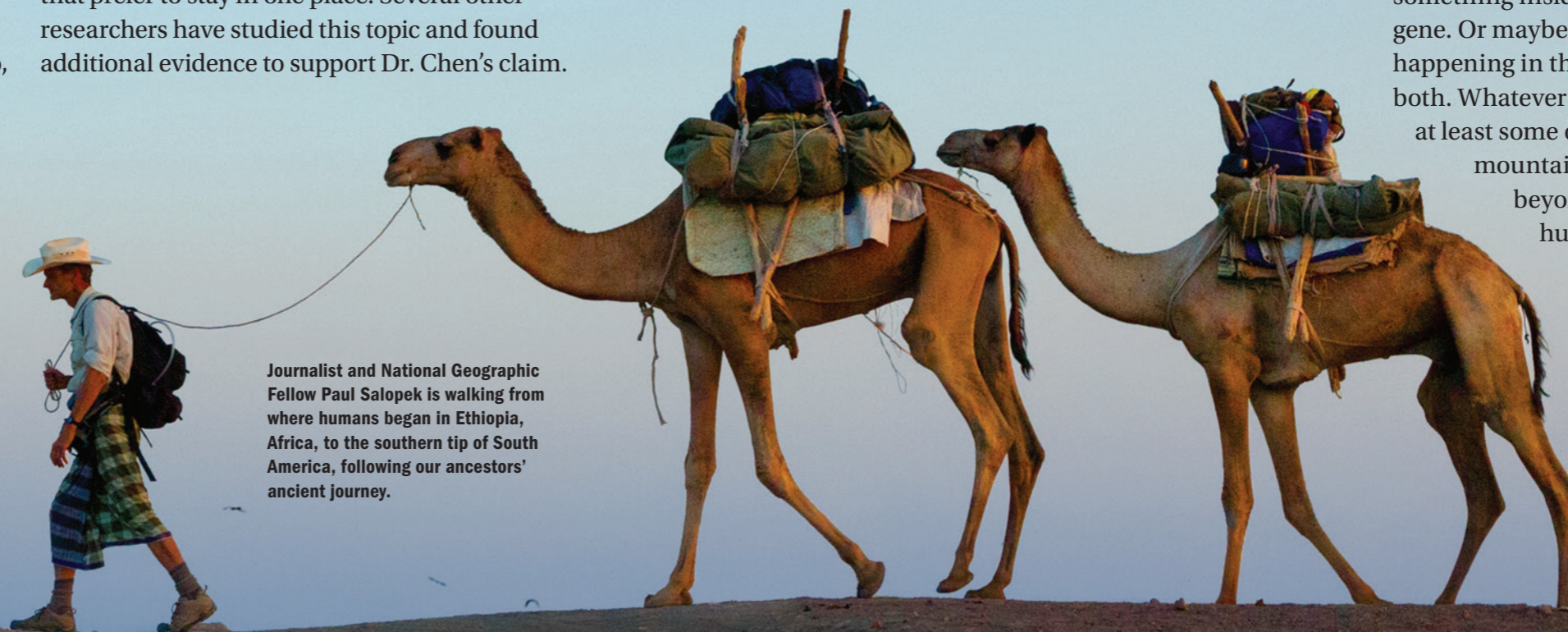
Perhaps it's in our DNA. In 1999, Dr. Chuansheng Chen led a team of scientists who were studying a gene known as *DRD4-7R*. This gene is found in about twenty percent of all humans. It's been associated with higher rates of risk-taking, exploration, and interest in new ideas. Dr. Chen found that *DRD4-7R* is more common in societies that move

around a lot than those who don't. For example, studies in Africa show that the gene is much more common in nomadic tribes than in tribes that prefer to stay in one place. Several other researchers have studied this topic and found additional evidence to support Dr. Chen's claim.

But can a single gene be responsible for a trait as complex as the desire to explore? Dr. Kenneth Kidd doesn't think so. He thinks *DRD4-7R* might increase curiosity, but other equally important sets of genes give us intelligent minds and skilled hands. We then use our minds and hands to create things. He believes that not just one gene, but groups of genes work together to create complex behaviors like exploration.

The context we live in also plays a role in our desire to explore. For example, during the European Age of Exploration, explorers became rich and famous for their discoveries. This drove others to try to increase their wealth through exploration. In this case, their exploration was more likely motivated by money than by genes.

Maybe the desire to explore comes from something inside us, such as the *DRD4-7R* gene. Or maybe it has more to do with what's happening in the world around us. Maybe both. Whatever the reason, it seems we (or at least some of us) will keep exploring the mountains, the sea, the stars, and beyond, because that's just what humans do.



Journalist and National Geographic Fellow Paul Salopek is walking from where humans began in Ethiopia, Africa, to the southern tip of South America, following our ancestors' ancient journey.

**17 Before you read, discuss in pairs.** Based on the title and the photo, what do you think you'll learn in this reading?

**18 Learn new words.** Find these words in the reading. What do you think they mean? Look at how they're pronounced in a dictionary. Say them aloud. Then listen and repeat. **TR: 67**

associated      gene      to motivate      trait

**19 While you read, think about a person you know who might have the explorer gene.** **TR: 68**

**20 After you read, work in pairs to answer the questions.**

1. What makes humans explore? How are we different from other animals?
2. What traits is the *DRD4-7R* gene associated with?
3. What percent of humans have this gene?
4. What is Dr. Kenneth Kidd's opinion regarding *DRD4-7R*'s connection to exploration?
5. What else might cause humans to explore?

**21 Work in pairs.** Describe the person that you thought of in Activity 19. Give examples to explain why you think this person has the gene.

**22 Discuss in groups.**

1. Do you believe a gene causes humans to explore? Or do you think it has more to do with other factors? Explain.
2. Do you think you have the *DRD4-7R* gene? Explain with examples. What other beliefs and behaviors might be caused by something in your genes?
3. Are humans exploring more now than in the past? Will we ever stop exploring? Explain.

**23** Before you watch, discuss in pairs. Why is it important to explore?

**24** Watch scene 5.1. While you watch, complete the quotes.

1. "It's part of \_\_\_\_\_ to be \_\_\_\_\_ and to want to learn more about the world."
2. "It \_\_\_\_\_. I mean that's what exploring is about."
3. We think we know \_\_\_\_\_, but we don't. We think we know \_\_\_\_\_, but we don't. We think we \_\_\_\_\_, but we don't.
4. "By knowing what's out there, we \_\_\_\_\_."

**25** After you watch, read and circle the correct letter.

1. Which of the following reasons for exploring is not mentioned in the video?
  - a. Exploring helps us engage more fully with our world.
  - b. Exploring will make us famous.
  - c. Exploring is part of human nature.
2. Why is it important to care about what's out there?
  - a. So that we can stop asking questions.
  - b. So that we can engage with our world and act with love.
  - c. Because very few people do.
3. What do we use to help us explore?
  - a. Information about the people who came before us
  - b. Information about new species of animals
  - c. The high-tech tools of science
4. Why is technology important for exploration?
  - a. Because without technology, it's impossible to discover any new animal species.
  - b. Because it lets us explore places that are otherwise inaccessible.
  - c. Because technology is so important for conservation.

**26** Work in pairs. Review your answer for Activity 23. Compare it with what you heard in the video. Discuss your comparisons with your partner.

**27** Work in groups. You're in charge of a school-wide campaign to promote exploration. Create a poster or an advertisement on the benefits of exploring. Present your work to the class.

**28** Choose an activity.

1. **Work independently.** Research one of the explorers from the video to learn more about his/her work. Share what you learn with the class.
2. **Work in pairs.** Make your own video, similar to this one. Interview other students and ask them, "What can we learn from exploring our region?"
3. **Work in groups.** Research a recent discovery of a new species. Find out who the explorers were, where they went, and what led them to the discovery.

Explorers camping near the Nyiragongo volcano, Democratic Republic of the Congo

**GRAMMAR** TR: 69

**Geographic use of the**

I'm going to **the Himalayas** to climb **Mt. Everest**.

**The Yangtze** is the longest river in **Asia**. **Lake Baikal** is the largest lake in **Asia**.

**The equator** passes through **Isabella Island**, the largest of **the Galápagos Islands**.

Explorer Ferdinand Magellan was born in **Portugal**, but died in **the Philippines**.

Explorer Gertrude Bell wrote a book about **Syria** after her travels to **the Middle East**.

**29 Read.** Fill in the timeline of female explorers by adding *the* when necessary.

**1805**

Native American Sacagawea guided Lewis and Clark through \_\_\_\_\_ Oregon Territory of \_\_\_\_\_ United States.



**1908**

Mountaineer Annie Smith Peck was the first person to climb \_\_\_\_\_ Huascarán, a 6,768 m (22,204 ft.) mountain in \_\_\_\_\_ Peru.



**1953**

Eugenie Clark wrote a book about studying sharks in \_\_\_\_\_ South Pacific Ocean and \_\_\_\_\_ Sea of Cortez, near \_\_\_\_\_ Mexico.



**1894**

Mary Kingsley traveled to \_\_\_\_\_ Sierra Leone, then \_\_\_\_\_ Gabon and up \_\_\_\_\_ Ogowe River by canoe, encountering hippos, crocodiles, and gorillas.



**1932**

Amelia Earhart flew solo across \_\_\_\_\_ Atlantic Ocean from \_\_\_\_\_ Canada to \_\_\_\_\_ Ireland.



**30 Work in pairs.** Cut out the cards and place them face-down. Take turns trying to match the information with the explorer. When you make a match, describe the explorer's work, using the places on the card.

Go to p. 167.



**WRITING**

When we compare and contrast two people, things, or ideas, we use phrases such as the following:

<i>Compare:</i>	<b>in the same way</b>	<b>likewise</b>	<b>similarly</b>
<i>Contrast:</i>	<b>by comparison</b>	<b>in contrast</b>	<b>on one hand . . . on the other hand</b>

**31 Read the model.** Work in pairs to identify the parts of the writing. How does the writer compare and contrast exploration past and present? Underline the phrases.

Exploration has changed a lot over time. In the past, only adventurers who were willing to take risks were considered explorers. In contrast, anyone can be an explorer today thanks to modern technology.

In the past, when explorers traveled the world, people back home had to wait for months to hear about their adventures. Explorers kept journals and wrote letters about their experiences. They would only be able to tell others what they saw after they returned. By the end of the nineteenth century, explorers were also able to take photos in the same way that they do today. However, they were unable to see the photos right away. It often took a long time for them to get photos printed.

By comparison, today's explorers can travel around the globe and can send back live, real-time images. Thanks to high-tech devices and the Internet, anyone can interact with them. When a discovery is made, we can see photos on social media and read blog posts the same day. We may not be there, but we still take part in the adventure. Similarly, thanks to high-tech cameras and 3D scanners, archeologists and other scientists can now study objects without ever touching or removing them from their sites. This way, people can learn about these things without the risk of harming or breaking them.

There are similarities between exploration in the past and the present. For example, explorers are driven by curiosity and the desire for knowledge about the world. Likewise, people want to share what they discover with others, both in writing and with photos. So, even though the methods may be different, our reasons for exploring have stayed the same over time.

**32 Work in pairs.** How is the way we explore different now compared to the past?

**33 Write.** Write an essay that compares and contrasts exploring out in the field with exploring virtually.





## Learn by Doing

**“If you have curiosity, you have to be an explorer. You have to go out and find the answers yourself without waiting to get them from others.”**

—Corey Jaskolski

National Geographic Explorer, Engineer/Inventor

1. **Watch scene 5.2.**
2. How do you learn best—by listening to your teacher or by doing something for yourself? What are the advantages of each type of learning? Talk about a time when you learned something new just by doing it.
3. When you go to a new place, what tools do you use to help you explore? What other tools could you use to learn about another place? Name two or three that you would like to have.

# Make an Impact

## A Plan an expedition.

- Research where you will explore and what you hope to find.
- Plan your expedition. Create an itinerary with photos and a map showing where you plan to explore. Add as much detail as possible.
- Present your plan to the class.

## B Profile a well-known explorer.

- Research an explorer from the past or present.
- Prepare a biography of the explorer. Include information on where he/she has explored, what he/she has discovered, and his/her methods and tools.
- Create a poster or a computer-based presentation to share what you learned.

## C Explore from home.

- Research different ways to explore without leaving your home.
- Identify advantages and disadvantages of virtual exploration.
- Write a feature article to describe ways for people to explore virtually. Use examples from your own experience.

