HIGH-TECH
SOLUTIONS

An augmented reality display provides a driver with up-to-date traffic and weather information.

WARM UP

Discuss these questions with a partner.

1. What types of new technology have you seen in the past 10 years?

2. Have any of these types of technology been helpful to you? In what ways?

DISCUSSION **A.** Read the caption below. What could be some other uses of VR? Discuss with a partner.

PREDICTING **B.** How might VR be used in the areas below? Note your ideas. Then read the passage to learn more.

- Training athletes
- Helping with business meetings
- Raising environmental awareness

> A patient experiences a Virtual Reality (VR) therapy session in Marseille, France. VR is an interactive simulation of a realistic environment using computer-generated sounds and visuals.

THE POWER OF VIRTUAL REALITY

A *People have talked about the possibilities of virtual reality since the mid-1990s. In this interview, Jeremy Bailenson—director of the Virtual Human Interactive Lab at Stanford University—explains how these possibilities are now becoming real.*

Interviewer: What's the difference between watching a video and wearing a VR headset?

B **JB:** The difference is what psychologists call "embodied cognition." That is, we learn by doing. For a lot of the most important learning events in your life, you actually did something—you walked somewhere or felt something. Similarly, Virtual Reality is active, not **passive**. You learn in ways that people have been learning for hundreds of thousands of years: by having an experience.

C Our lab studies have shown that, in general, the brain tends to **treat** a VR event in a similar way to an **actual** event. So there's a difference between performing an event in a traditional video game and doing it inside VR.

Interviewer: You've said that VR can help athletes. What's an example of that?

D **JB:** We **demonstrated** in the 2014 NFL[1] season that VR could help quarterbacks[2] by improving their decision-making accuracy and reducing their reaction times. Carson Palmer is one of the earliest adopters. VR gave him a tool he could use to learn the plays[3] better. Carson had a system in his home. For just a couple minutes a day, after he'd wake up, he'd **go over** his plays and mentally practice what he was going to do. It was as though he were actually on the field. But he was in his living room, getting extra practice.

E Since then, VR has been used by teams across many sports. The German national soccer team, among others, uses it in their practice quite often.

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1 The **NFL** (National Football League) is a professional American football league.
2 In American football, the **quarterback** is a player who directs a team's attack.
3 In sports, a **play** is a planned action that happens in a game.

A video gamer tries a wireless VR headset at the 2019 Consumer Electronics Show in Las Vegas.

Interviewer: Explain how VR avatars[4] can improve video conferencing.

F   **JB:** Video conferencing is good for some activities. But it's not good for an important meeting where intense decisions have to be made. One reason is the eye contact problem. If you look at the camera on the top of your laptop, you don't see the other person. **Conversely**, if you look at the other person's image on your screen, you're not looking at the camera.

G   Psychologists have shown that *very* small changes in things like eye contact, body space, or posture **alter** the way conversations flow. With VR avatars, you can control things like body position and eye contact in a way you can't do with video **conferences**.

Interviewer: You have said that VR can help save the planet. How can VR raise awareness of environmental issues?

H   **JB:** One example is an experiment on the island of Ischia, in Italy. Ischia is a marine site that scientists have been studying for decades. Carbon dioxide is destroying its coral and degrading[5] the food web.[6] I can't bring the entire world to Ischia to show how CO_2 degrades ecosystems. But with VR, I can bring Ischia to *people*.

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4   An **avatar** is a 3-D image of a person. In a VR conference, each participant's avatar appears on screen in the same room.
5   If a chemical **degrades** something, it causes it to break down and deteriorate.
6   A **food web** is a combination of the individual food chains in a community.

I   So, we produced a seven-minute journey that shows how all the oceans will look in about 50 years, based on this one site in Ischia. Using this VR model, people **get to** be scientists. They explore the effects of CO_2 on various species in the ecosystem, and learn by *doing*.

Interviewer: What about the **downsides** of VR—for example, using it to create violent video games?

J   **JB:** The way I think of VR is that we should use it for things that we can't do in the real world. You should use VR to go to the moon or try becoming someone else. But you *shouldn't* do things that you *wouldn't* do in the real world.

Interviewer: In your opinion, will VR change how we interact with other people in the real world?

K   **JB:** VR is a tool, just like any other media. But it has a different impact on how we perceive information. That's because you're using your body and it's completely immersive. It's a big jump in the history of media. But I don't think it's going to change who people are. I think we will continue to be the same humans that we have been on the planet for quite some time. And I, for one, am glad of that.

The interview was edited for length and clarity.

A soccer goalkeeper trains using a Virtual Reality headset.

A. Choose the best answer for each question.

GIST

1. What would be the best alternative title for this passage?

a. How VR Brings Us All Together
b. The Future of VR Gaming
c. VR: A Useful Tool for the 21st Century
d. Saving the Planet with VR

INFERENCE

2. Which of these is NOT an example of embodied cognition?

a. watching a soccer game on TV
b. cooking a meal using a recipe
c. completing a crossword puzzle
d. playing a musical instrument

∧ **Sales of VR headsets are projected to be over 120 million in 2022.**

MAIN IDEA

3. What is the purpose of the Ischia VR model?

a. to propose a new way of saving sea life near Ischia
b. to recreate what the climate in Italy was like in the past
c. to show how oceans are being damaged by climate change
d. to explain how pollution from Ischia is affecting other areas

VOCABULARY

4. Which of the following is closest in meaning to *adopters* in paragraph D?

a. users   c. athletes
b. inventors   d. quarterbacks

PARAPHRASE

5. What is Bailenson's main point in the final paragraph (K)?

a. Although VR technology is improving, other media will still be important.
b. VR is a major change, but it will not fundamentally change who we are.
c. It will take several years before people's lives are really affected by VR.
d. VR's impact is significant, but many people in the world will not notice it.

SHORT ANSWER

B. Write short answers. Use no more than three words from the reading passage for each answer.

1. According to Bailenson, how do people learn best? _____

2. In what other way did VR help American football players, in addition to improving decision-making? _____

3. In what other way can VR avatars improve video conferencing, in addition to body posture and space? _____

4. What does the Ischia VR model allow people to be? _____

5. How is VR similar to other types of media? _____

Applying Information from a Text

When you read a text, it is useful to consider how the writer's ideas might apply to other contexts. This can help you evaluate the usefulness of the writer's ideas and think about how well they transfer to other situations. When you apply information, you might predict what could happen in a similar situation, solve a problem using ideas from a text, or infer other information based on the writer's ideas.

IDENTIFYING ADVANTAGES

A. Match the advantages of using VR (a–f) to each situation, according to the passage. One advantage is not stated in the text.

Advantages of using VR…   People can…

1. to help athletes:

_____ _____

2. to improve video conferencing:

_____

3. at the Ischia marine site:

_____ _____

a. have clearer interactions with others.
b. react to situations more quickly.
c. visualize the impact on an environment over time.
d. see a place they'd normally not be able to visit.
e. avoid dangerous or life-threatening situations.
f. practice the same action many times.

APPLYING INFORMATION

B. Discuss these questions with a partner.

1. Aside from athletes, what other professions might benefit from VR? Consider people working in the following areas:

architecture   education   entertainment   health care   tourism

2. What other environmental problems might VR help people visualize better? How could VR help people explore the effects of these problems? Note down your ideas.

_____
_____
_____

CRITICAL THINKING Evaluating Pros and Cons

▶ What does the interviewer suggest is one possible downside to VR? Note it down.

_____

▶ What additional downsides to VR can you think of? Consider the areas below. Discuss your ideas with a partner.

health effects   social effects   financial effects

COMPLETION **A.** Complete the paragraph with words or phrases from the box. One word is extra.

actual	alter	get to	going over	passive	treat

∧ A patient uses VR to reduce her stress before surgery.

Virtual reality therapy (VRT) is a way to ¹_____ patients who suffer from psychological trauma.**¹** As with traditional treatments, VRT helps patients visualize the traumatic event so that they can overcome it. Instead of lying down and just talking to a therapist, VRT patients take a less ²_____ role: They use a VR headset to see, hear, and sometimes even smell the event. For example, a soldier can go back to a battlefield, or a firefighter can return to a burning building. In this way, patients ³_____ experience a virtual version that is similar to the ⁴_____ traumatic event. By ⁵_____ the event virtually, patients are able to reduce their anxiety and make progress in their therapy.

1 **Psychological trauma** describes damage to the mind caused by a distressing situation.
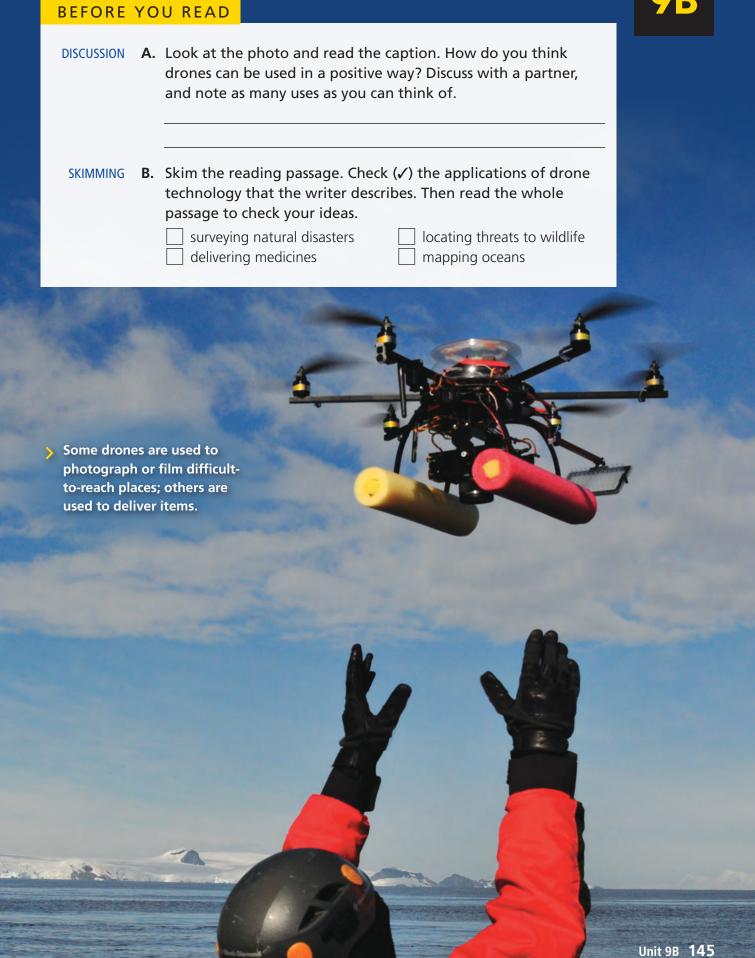
WORDS IN CONTEXT **B.** Complete each sentence. Choose the correct option.

1. The **downside** of something is the _____ aspect of it.
  a. positive   b. negative

2. At a **conference**, you are more likely to speak to _____.
  a. colleagues   b. family members

3. If you **demonstrate** a skill, you _____ it.
  a. show   b. hide

4. You use **conversely** to indicate an idea is _____ another idea.
  a. similar to   b. different from

WORD PARTS **C.** The word *down* can be used to form certain compound words, such as **downside**. Complete the sentences with a word from the box. One word is not used.

download	downpour	downside	downsize	downturn

1. Places that don't get much rain can get flooded by a sudden _____.
2. For some people, a _____ of living in the suburbs is the long drive to work.
3. An increase in interest rates can cause a _____ in the housing market.
4. Once their children are grown up, some parents _____ to a smaller house.

DISCUSSION **A.** Look at the photo and read the caption. How do you think drones can be used in a positive way? Discuss with a partner, and note as many uses as you can think of.

_____

_____

SKIMMING **B.** Skim the reading passage. Check (✓) the applications of drone technology that the writer describes. Then read the whole passage to check your ideas.

☐ surveying natural disasters   ☐ locating threats to wildlife
☐ delivering medicines   ☐ mapping oceans

> Some drones are used to photograph or film difficult-to-reach places; others are used to deliver items.

HIGH-FLYING HELPERS

Drones—originally created as tools of war—are now performing important humanitarian and conservation tasks around the world.

> **In Malawi, drones are used to transport blood and other medical samples from villages to city hospitals.**

Saving Lives

A Delivering **medical** supplies to hard-to-reach places has been an issue for years. Worldwide, more than two billion people lack access to essential life-saving supplies, such as blood and vaccines.[1] In the African nation of Rwanda, for example, several remote health clinics do not have **sufficient** quantities of blood and other healthcare products. As a result, many people die of treatable illnesses.

B A company called Zipline is trying to address this problem. It uses drones to transport medical supplies around Rwanda. In the past, it took hours for **packages** of medicines to reach some health clinics. However, a drone can now deliver medicine in 30 minutes. Thanks to this **rapid** healthcare service, fewer women suffer during childbirth and more children receive life-saving medicine.

C Drones are also assisting emergency organizations after natural disasters. In 2015, for example, a powerful cyclone destroyed thousands of buildings in the Pacific island nation of Vanuatu. Around 75,000 people lost their homes, and at least 15 died. After the storm, drones photographed the damage. These **surveys** helped emergency workers **assess** the situation quickly and answer important questions: Which areas were hardest hit? Were crops damaged? What roads were affected? Emergency workers used the data to create a detailed map of the affected area. They were then able to transport **aid** to the people who needed it most.

Eyes in the Sky

D Drones are also helping to protect vulnerable wildlife populations in parts of Africa and Asia. Every year, poachers[2] kill thousands of elephants, rhinos, and other endangered animals. To stop them, the environmental organization World Wildlife Fund (WWF) is using drones. "Drones help us see things we can't," says Colby Loucks, who works for the WWF. For example, they can show where poachers are hiding and if they are carrying weapons. Drones are particularly helpful at night, when poachers tend to be most active. Fitted with infrared video cameras, drones can easily identify people and animals in the dark. These drones are not only helpful, they are **affordable**. Drones with infrared cameras cost about $20,000 each—a fraction of the cost of other high-tech tools.

E As well as finding poachers, drones can be used to track animals. Scientists at Liverpool John Moores University plan to employ drones for an **ambitious** conservation project: documenting the world's wildlife. The long-term project will start with scientific surveys of animal populations. As the project expands, members of the public will be able to contribute by uploading their own drone footage.[3] Animal species can then be identified using special software. The project leader, biologist Serge Wich, predicts that drones—cheaper, more practical, and less dangerous than planes or helicopters—will become a widely used conservation tool. "I think we will have swarms of drones flying over forests," he predicts.

F Ironically, a tool originally created for **military** use is increasingly being used to save lives instead of taking them. Drones have the potential to provide solutions that will benefit both humans and animals, says photographer and environmentalist Kike Calvo. "There's nothing that can replace a good scientist," he says. But with the help of drones, "researchers are empowered to carry out projects they've never imagined before."

1 A **vaccine** is a medicine that prevents a dangerous disease.
2 **Poachers** are people who catch or kill animals illegally.
3 **Footage** of an event is the film that shows it.

A. Choose the best answer for each question.

GIST **1.** What is the reading passage mainly about?

a. successes and failures of recent drone technology

b. how drone delivery times have improved in recent years

c. examples of positive uses of drone technology around the world

d. predictions for how drone technology will change in the future

PURPOSE **2.** What is the main purpose of Zipline's drones?

a. to transport medicines to people's homes

b. to identify clinics most in need of medicine

c. to deliver medical supplies after a disaster

d. to get supplies quickly to remote health clinics

▲ **A drone delivers a first-aid package.**

DETAIL **3.** After the 2015 Vanuatu disaster, what were drones primarily used for?

a. surveying storm damage

b. analyzing weather conditions

c. delivering medical supplies

d. sending emergency messages

MAIN IDEA **4.** According to the passage, why are infrared drones especially useful?

a. They are silent and difficult to detect.

b. They can identify poachers at night.

c. They are cheaper than other types of drones.

d. They can be used near the ground and in the sky.

VOCABULARY **5.** Which of these is closest in meaning to *swarms* in the last sentence of paragraph E?

a. new types   c. small groups

b. large numbers   d. different kinds

SHORT ANSWER **B.** Write short answers. Use up to three words from the reading passage for each question.

1. What are two medical supplies that over two billion people do not have access to?

_____

2. About how long does it take to deliver a package to rural clinics using Zipline?

_____

3. What objects, belonging to poachers, are drones able to see?

_____

4. The John Moores project will eventually allow people to help by doing what?

_____

Recognizing Text Coherence

A reading passage is coherent when ideas flow together smoothly. Without coherence, a reader may have a difficult time understanding the main ideas and following the overall flow of a text. For a deeper understanding of a text, look for ways in which the writer connects his or her ideas. For example, notice how:

- key words and phrases (often nouns) are repeated to emphasize their importance
- synonyms for key terms show connections between sentences and paragraphs
- pronouns (*it, her*) and demonstratives (*that, those*) refer to previous ideas
- transitions (*However, In addition*) and conjunctions (*and, such as*) link ideas

ANALYZING **A.** Look at the section "Saving Lives" in the reading passage. Answer the following questions.

1. What key words or phrases related to *health* are used in paragraphs A and B?

_____

2. What two synonyms for *far away* appear in paragraph A? _____

3. What transition is used to introduce a reason or cause in paragraph B? _____

4. What does *it* refer to in the last line of paragraph C? _____

ANALYZING **B.** Look at the section "Eyes in the Skies." Choose the best answer for each question.

1. What does *them* refer to in the third sentence of paragraph D?

a. drones   b. elephants   c. poachers   d. the WWF

2. The author uses the transition *As well as* in paragraph E to give another example of how drones are _____.

a. saving humans   c. helping conservationists

b. tracking poachers   d. delivering medicines

3. In paragraph E, what example of *documenting* does the author NOT describe?

a. doing surveys   c. interviewing people

b. uploading drone footage   d. identifying species

4. In paragraph F, what does *a tool* refer to?

a. photography   b. drones   c. conservation   d. special software

5. What does *them* refer to in paragraph F?

a. tools   b. drones   c. military uses   d. lives

CRITICAL THINKING Applying Ideas   What other humanitarian or conservation tasks could drones be used for? List two ideas and share with a partner.

_____

_____

_____

COMPLETION **A.** Complete the information. Circle the correct words.

↗ **The 2-meter wide SmartBird drone was modeled after a herring gull.**

Quadcopters—the most popular type of drone today—work well to deliver [1]**medical** / **packages** and to [2]**aid** / **assess** storm damage. A quadcopter is practical and [3]**affordable** / **sufficient**, making it possible for even small organizations to buy. But it's a noisy machine compared to quieter, but more expensive, plane-like drones.

A(n) [4]**ambitious** / **rapid** new project aims to offer the best of both worlds: ornithopter drones. Ornithopters have flapping wings that can cross the sky quietly and efficiently. They can also take off and land in tight spaces. Drone builders hope to make ornithopter drones that work even more like birds. One day, drones could move as [5]**ambitiously** / **rapidly** as falcons—diving out of the sky at 320 kilometers per hour.

DEFINITIONS **B.** Complete the definitions. Circle the correct option.

1. If you give someone **aid**, you *help* / *move* them.
2. Someone who is **ambitious** is determined to *succeed* / *help*.
3. If you **survey** something, you examine it *in detail* / *slowly*.
4. If something is **sufficient**, it is *not enough* / *enough*.
5. The **military** mostly consists of *armed* / *unarmed* soldiers.
6. **Medical** supplies consist of items that improve people's *health* / *wealth*.

COLLOCATIONS **C.** The verbs in **bold** are often used before the noun **aid**. Circle the correct options.

1. Some homeless people **provide** / **receive** aid in the form of temporary shelter.
2. Many college students **depend on** / **withhold** financial aid to pay for their education.
3. An aid organization might **call for** / **suspend** aid operations if their emergency workers are in danger.
4. After it was hit by Hurricane Maria, officials in Puerto Rico **appealed for** / **extended** aid so they could rebuild.

DRONE
DELIVERY

↗ **A courier sends off a package using a delivery drone.**

BEFORE YOU WATCH

DEFINITIONS **A.** Read the information. The words and phrases in **bold** appear in the video. Fill in the blanks to complete the definitions.

Matt Sweeny is the founder of a drone company called Flirtey. This little **startup** is competing with technology giants like Amazon and Google to provide a delivery service, **at a premium**, using drones that can **autonomously** deliver **over-the-counter** medicines and other products to customers' homes. Flirtey currently has a **head start** in the market, but whether it can succeed in the delivery business is yet to be seen.

1. A _____ is a small, new company.
2. If a company or product has a(n) _____, it has an early lead over its rivals.
3. A machine that works _____ does things automatically and on its own.
4. _____ medicine can be bought without needing approval from a doctor.
5. If something is sold _____, it is quite expensive.

PREDICTING **B.** What kind of products would be suitable for drone delivery? Note your ideas with a partner.

_____
_____

SEQUENCE **A.** How do you think a Flirtey drone completes a delivery? Order the steps (1–7). Then watch the video to check your ideas.

Step _____: The drone lowers its package.

Step _____: The package is loaded onto the drone.

Step _____: The drone flies back to its headquarters.

Step __1__: A customer makes an order with a smartphone.

Step _____: The drone takes off from Flirtey's headquarters.

Step _____: The drone uses GPS to fly to the customer's location.

Step _____: The drone hovers about 15 meters in the air.

DETAILS **B.** Watch the video again. Are the following statements true or false, or is the information not mentioned? Circle T (true), F (false), or NG (not given).

1. The Flirtey delivery service is still waiting for government approval.	**T F NG**
2. The company has tested several different drone models.	**T F NG**
3. The drones can deliver hot food such as pizza.	**T F NG**
4. The company hopes to complete local deliveries within 10 minutes.	**T F NG**
5. The drones are powered by solar panels.	**T F NG**

CRITICAL THINKING Evaluating Pros and Cons Work in a small group. Imagine that drone deliveries become extremely common. What might be some pros and cons of this? Consider areas such as:

practical issues   safety   long-term effects on society

_____

_____

VOCABULARY REVIEW

Do you remember the meanings of these words? Check (✓) the ones you know. Look back at the unit and review any words you're not sure of.

Reading A

☐ actual   ☐ alter*   ☐ conference*   ☐ conversely*   ☐ demonstrate*

☐ downside   ☐ get to   ☐ go over   ☐ passive*   ☐ treat

Reading B

☐ affordable   ☐ aid*   ☐ ambitious   ☐ assess*   ☐ medical

☐ military*   ☐ package   ☐ rapid   ☐ sufficient*   ☐ survey*

* Academic Word List