Reading



EXPERT

Voyage

1

Reading *Voyage*



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Components Main Book / Workbook / 1 Audio CD
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Unit Components

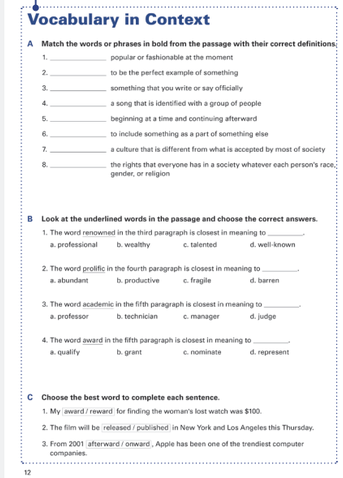
Before You Read

This section helps students think about and predict the topic before reading the passage. It also enables students to better understand the reading passages by providing additional information related to the topic.



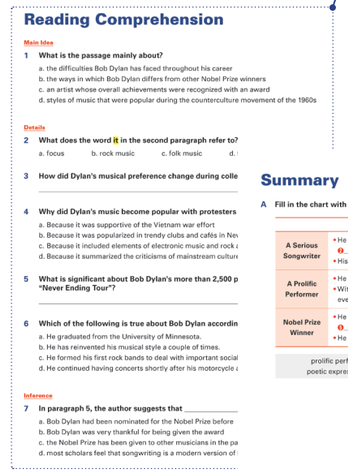
Vocabulary in Context

Students can learn the key words from the passage by matching them with their definitions and synonyms.



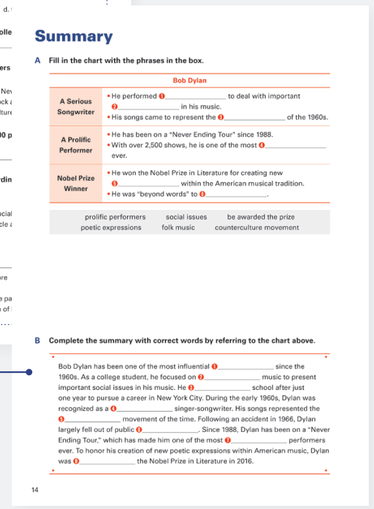
Reading Comprehension

This portion asks students to identify the main idea, details, and draw inferences from the passages through multiple-choice and short-answer questions.



Summary

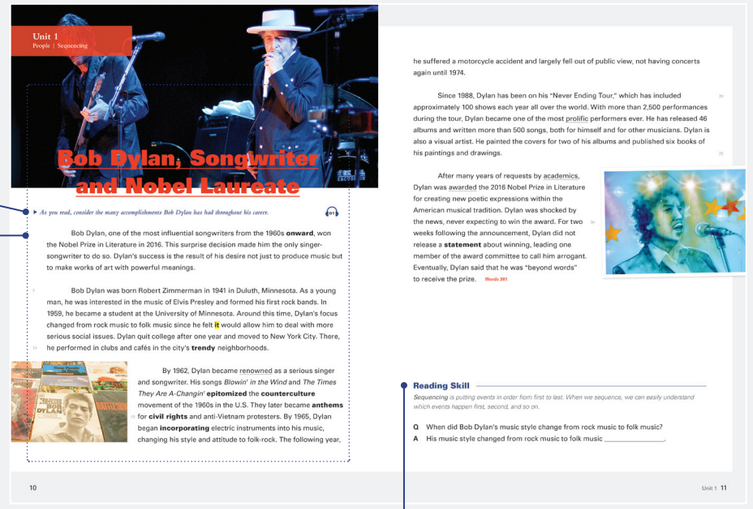
Students can review the essential information from the passage by filling in the graphic organizer and the summary.



Main Reading Passage

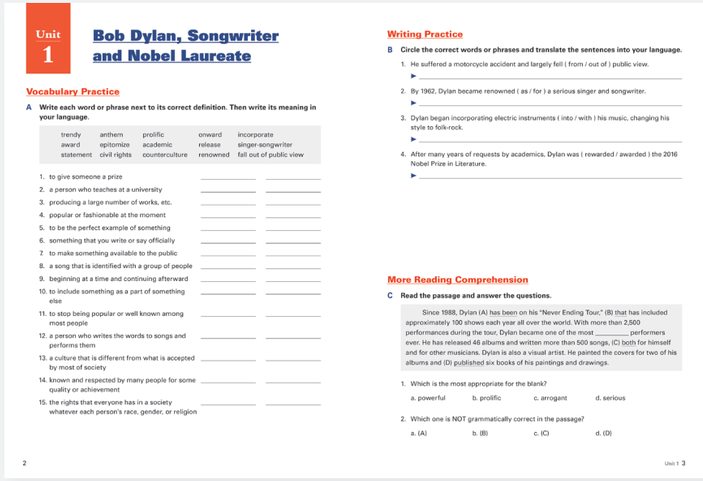
A focus sentence gives students tips to help them understand the main idea of the text.

The passages are written to be as interesting and informative as possible, covering a variety of topics such as history, technology, and social issues.



Reading Skill

Students can review the key concepts of the passage by practicing various reading skills including identifying the main idea, sequencing, cause and effect, and more.



Workbook

Extra vocabulary and writing practice, and reading comprehension questions are provided to enable students to review the reading passages more deeply.

Audio CD The audio CD includes recordings of all the main reading passages.

Online Supplement MP3 files, answer keys, translations, vocabulary lists, and additional test sheets (review test, midterm test, final test) are provided free online at www.darakwon.co.kr.

A program for generating vocabulary and writing test sheets is available free online at voca.darakwon.co.kr.

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Unit 1

Theme | *People*
Reading Skill | *Sequencing*

Bob Dylan, Songwriter and Nobel Laureate



Before You Read

A Think about the Topic

1. What role do you think singer-songwriters play in society?
2. How do you think writing song lyrics is like writing literature?

B Background Knowledge

Bob Dylan is one of the most beloved and respected musicians in the world. With a career spanning more than five decades, Bob Dylan has released dozens of albums and written hundreds of hit songs. However, Dylan's cultural impact goes beyond music itself. His style and public presence helped to bring folk-rock music into mainstream society and inspired political protests against injustice. In recognition of his cultural impact, Dylan was given the 2016 Nobel Prize in Literature. His life goes to show that standing up for your beliefs and doing what you enjoy can lead to the highest levels of success.



Unit 1
People | Sequencing

Bob Dylan, Songwriter and Nobel Laureate

▶ *As you read, consider the many accomplishments Bob Dylan has had throughout his career.* 01

Bob Dylan, one of the most influential songwriters from the 1960s **onward**, won the Nobel Prize in Literature in 2016. This surprise decision made him the only singer-songwriter to do so. Dylan's success is the result of his desire not just to produce music but to make works of art with powerful meanings.

Bob Dylan was born Robert Zimmerman in 1941 in Duluth, Minnesota. As a young man, he was interested in the music of Elvis Presley and formed his first rock bands. In 1959, he became a student at the University of Minnesota. Around this time, Dylan's focus changed from rock music to folk music since he felt it would allow him to deal with more serious social issues. Dylan quit college after one year and moved to New York City. There, he performed in clubs and cafés in the city's **trendy** neighborhoods.



By 1962, Dylan became renowned as a serious singer and songwriter. His songs *Blowin' in the Wind* and *The Times They Are A-Changin'* **epitomized** the **counterculture** movement of the 1960s in the U.S. They later became **anthems** for **civil rights** and anti-Vietnam protesters. By 1965, Dylan began **incorporating** electric instruments into his music, changing his style and attitude to folk-rock. The following year, he suffered a motorcycle accident and largely fell out of public view, not having concerts again until 1974.

Since 1988, Dylan has been on his "Never Ending Tour," which has included approximately 100 shows each year all over the world. With more than 2,500 performances during the tour, Dylan became one of the most prolific performers ever. He has released 46 albums and written more than 500 songs, both for himself and for other musicians. Dylan is also a visual artist. He painted the covers for two of his albums and published six books of his paintings and drawings.

After many years of requests by academics, Dylan was awarded the 2016 Nobel Prize in Literature for creating new poetic expressions within the American musical tradition. Dylan was shocked by the news, never expecting to win the award. For two weeks following the announcement, Dylan did not release a **statement** about winning, leading one member of the award committee to call him arrogant. Eventually, Dylan said that he was "beyond words" to receive the prize. Words 381



Reading Skill

Sequencing is putting events in order from first to last. When we sequence, we can easily understand which events happen first, second, and so on.

Q When did Bob Dylan's music style change from rock music to folk music?

A His music style changed from rock music to folk music around 1959.

Vocabulary in Context

A Match the words or phrases in bold from the passage with their correct definitions.

1. trendy — popular or fashionable at the moment
2. epitomize — to be the perfect example of something
3. statement — something that you write or say officially
4. anthem — a song that is identified with a group of people
5. onward — beginning at a time and continuing afterward
6. incorporate — to include something as a part of something else
7. counterculture — a culture that is different from what is accepted by most of society
8. civil rights — the rights that everyone has in a society whatever each person's race, gender, or religion

B Look at the underlined words in the passage and choose the correct answers.

1. The word renowned in the third paragraph is closest in meaning to _____.
   a. professional b. wealthy c. talented ✓d. well-known

2. The word prolific in the fourth paragraph is closest in meaning to _____.
   a. abundant ✓b. productive c. fragile d. barren

3. The word academic in the fifth paragraph is closest in meaning to _____.
   ✓a. professor b. technician c. manager d. judge

4. The word award in the fifth paragraph is closest in meaning to _____.
   a. qualify ✓b. grant c. nominate d. represent

C Choose the best word to complete each sentence.

1. My award / reward for finding the woman's lost watch was $100.
2. The film will be released / published in New York and Los Angeles this Thursday.
3. From 2001 afterward / onward, Apple has been one of the trendiest computer companies.

Reading Comprehension

Main Idea

1 What is the passage mainly about?

a. the difficulties Bob Dylan has faced throughout his career
b. the ways in which Bob Dylan differs from other Nobel Prize winners
✓c. an artist whose overall achievements were recognized with an award
d. styles of music that were popular during the counterculture movement of the 1960s

Details

2 What does the word it in the second paragraph refer to?

a. focus b. rock music ✓c. folk music d. the University of Minnesota

3 How did Dylan's musical preference change during college?

He started to focus more on folk music.

4 Why did Dylan's music become popular with protesters during the 1960s?

a. Because it was supportive of the Vietnam war effort
b. Because it was popularized in trendy clubs and cafés in New York
c. Because it included elements of electronic music and rock and roll
✓d. Because it summarized the criticisms of mainstream culture that time

5 What is significant about Bob Dylan's more than 2,500 performances during his "Never Ending Tour"?

It makes him one of the most prolific performers in history.

6 Which of the following is true about Bob Dylan according to the passage?

a. He graduated from the University of Minnesota.
✓b. He has reinvented his musical style a couple of times.
c. He formed his first rock bands to deal with important social issues.
d. He continued having concerts shortly after his motorcycle accident.

Inference

7 In paragraph 5, the author suggests that _____.

a. Bob Dylan had been nominated for the Nobel Prize before
✓b. Bob Dylan was very thankful for being given the award
c. the Nobel Prize has been given to other musicians in the past
d. most scholars feel that songwriting is a modern version of literature

Summary

A **Fill in the chart with the phrases in the box.**

Bob Dylan	
A Serious Songwriter	• He performed ❶ folk music to deal with important ❷ social issues in his music. • His songs came to represent the ❸ counterculture movement of the 1960s.
A Prolific Performer	• He has been on a "Never Ending Tour" since 1988. • With over 2,500 shows, he is one of the most ❹ prolific performers ever.
Nobel Prize Winner	• He won the Nobel Prize in Literature for creating new ❺ poetic expressions within the American musical tradition. • He was "beyond words" to ❻ be awarded the prize.

prolific performers　social issues　be awarded the prize
poetic expressions　folk music　counterculture movement

B **Complete the summary with correct words by referring to the chart above.**

Bob Dylan has been one of the most influential ❶ singer-songwriters since the 1960s. As a college student, he focused on ❷ folk music to present important social issues in his music. He ❸ left school after just one year to pursue a career in New York City. During the early 1960s, Dylan was recognized as a ❹ serious singer-songwriter. His songs represented the ❺ counterculture movement of the time. Following an accident in 1966, Dylan largely fell out of public ❻ view. Since 1988, Dylan has been on a "Never Ending Tour," which has made him one of the most ❼ prolific performers ever. To honor his creation of new poetic expressions within American music, Dylan was ❽ awarded the Nobel Prize in Literature in 2016.

Unit 2

Theme | *History*
Reading Skill | *Cause & Effect*

The Advanced Civilization of the Maya

Before You Read

A **Think about the Topic**

1. Have you ever heard of the Maya civilization?
2. What kinds of ancient writing systems have you heard of?

B **Background Knowledge**

Many advanced civilizations arose in Central America thousands of years ago, and they continued to develop for centuries. The civilizations were made up of cities and empires, and they were responsible for several important cultural and scientific developments in the Americas. Some of the greatest of these civilizations are pre-Columbian cultures. These usually refer to the native cultures in the Americas that developed before Christopher Columbus reached America. More broadly, they refer to cultures that existed without any major European influence. One of the most developed pre-Columbian civilizations was that of the Maya.



Unit 2
History | Cause & Effect

The Advanced Civilization of the Maya

▶ *As you read, take note of how advancements in farming allowed for other developments.* 02

Central America was the location of many ancient civilizations that were just as advanced as those found in Greece and China. A number of different cultures flourished. Each had its own remarkable achievements, but all interacted, creating a related culture. The most important of these was the Maya, mainly due to its **longevity** and social stability. Lasting from 2000 B.C. to 1500 A.D., the Maya created a civilization that many researchers consider to be the **apex** of pre-Columbian culture in the Americas.



▲ Slash-and-burn agriculture

The early Maya used a system of slash-and-burn agriculture. Simply put, large areas of the rainforest were burned, resulting in land that could be used for a season. Afterward, it would have to be **abandoned**. However, as their cities grew, more advanced methods were needed to support the expanding population. Large tracts of land were established for the sole purpose of farming. Farmers would then **alternate** between the **plots** to ensure that one area was not overused. At the same time, **irrigation** technology was developed, and this allowed farmers to increase the production of the fields.

As farms became more efficient, urban societies became possible. Most Mayan cities had high population **densities**. They were controlled by a king who had absolute power and served as the religious head, conducting all important ceremonies. The **monarchy** was passed down from generation to generation. The next social class was the noble class. These wealthy and powerful individuals worked as priests, government officials, and military leaders. Like the monarchy, their positions were passed down to their young. The remaining 90 percent of the population consisted of commoners, who did all the labor, paid taxes, and served in the military. By displaying exceptional skills and hard work, it was sometimes possible for commoners to become influential members of Mayan society.



◀ A figure of a Mayan King

While each *city-state was independent, they were still tied together through extensive trade and a shared writing system. However, few samples of their writing still exist. Their books, known as *codices, were constructed out of tree bark. Most have decayed over the years, but the few that still exist show that the Maya had advanced systems of math and science. Yet there are no clues that explain why the Maya died out.



▲ The Maya writing system

Words 369

*city-state: a city that is also considered an independent state or nation
*codex (*pl.* codices): an ancient book or text that has social importance

Reading Skill

Cause and effect is when one event causes something to happen. The cause explains why something happens, and the effect is what happens as a result.

Q Why did Mayan farmers develop new farming methods?

A Because the slash-and-burn method was not efficient enough to support an increasing population

Vocabulary in Context

A **Match the words in bold from the passage with their correct definitions.**

1. longevity — the fact of living or lasting a long time
2. abandon — to stop using or doing something
3. monarchy — the system of having a king or queen
4. apex — the highest point of something; a pinnacle
5. alternate — to use or do something in repeated turns
6. plot — a small area of land used for a specific purpose
7. density — the degree to which an area is filled with people or things
8. irrigation — the practice of supplying land with water so that crops or plants will grow

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word interact in the first paragraph is closest in meaning to _____.
   a. hide b. evade c. speak ✓d. cooperate

2. The word tract in the second paragraph is closest in meaning to _____.
   a. track ✓b. area c. colony d. trade

3. The word absolute in the third paragraph is closest in meaning to _____.
   a. major b. considerate ✓c. full d. required

4. The word extensive in the fourth paragraph is closest in meaning to _____.
   ✓a. broad b. restricted c. narrow d. planned

C **Choose the best word to complete each sentence.**

1. The house is surrounded by vegetable plots / pieces which were planted in the spring.
2. My roommates and I alter / alternate between doing different chores around the house.
3. The first few months after immigrating to the U.S., Francis didn't interact / integrate with the kids in his class because of his poor English.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the development of farming in early societies
b. the role of the king in ancient Mayan society
✓c. the traits of an important ancient society
d. the influence of the Maya on Central American cultures

Details

2 **Why are the Maya considered to be the most important of all civilizations of Central America?**

Because of their longevity and social stability

3 **What does the word it in the second paragraph refer to?**

a. agriculture ✓b. land c. the rainforest d. the early Maya

4 **Which of the following is NOT true about the new farming methods of the Maya?**

✓a. Some areas of land were overused.
b. Large areas of land were used only for farming.
c. They developed because of an increasing population.
d. Farmers could produce more crops because of irrigation technology.

5 **How were Mayan kings chosen?**

The monarchy was passed down from generation to generation.

6 **Which of the following is true about the Maya according to the passage?**

✓a. It was possible for commoners to improve their social status.
b. Members of the noble class could not keep their positions across generations.
c. The civilizations of Greece and China were more advanced than the Maya.
d. The independent Mayan city-states sometimes fought wars with one another.

Inference

7 **What can be inferred about codices according to paragraph 4?**

a. They have all disappeared over time.
b. They were made from an early form of paper.
c. They are written in a language that is still not understood.
✓d. They offer some evidence of Mayan academic developments.

Summary

A **Fill in the chart with the phrases in the box.**

The Ancient Civilization of the Maya	
The Maya	• They were one of the ❶ most advanced ancient civilizations in Central America. • They lasted for 3,500 years and were very stable.
Mayan Agriculture	• The early Maya used ❷ slash-and-burn agriculture techniques. • Farmers later developed more efficient farming methods due to ❸ the rising population.
Urban Society	• The king had ❹ absolute power, and the nobles worked as priests, government officials, and military leaders. • Commoners ❺ did all the labor, paid taxes, and served in the military.
Ties Between City-states	• They traded and used the same ❻ writing system. • The Maya had advanced systems of science and math.

slash-and-burn　　writing system　　most advanced
the rising population　　absolute power　　did all the labor

B **Complete the summary with correct words by referring to the chart above.**

The Maya are considered to be the pinnacle of ancient ❶ Central American civilizations. Early Mayans used the slash-and-burn farming method, but an increase in the ❷ population led to the development of more sophisticated ❸ agricultural systems. Mayan social ❹ classes were rigid and controlled by a single ruler. ❺ Commoners made up the majority of the population and did most of the work in Mayan society, though it was possible for hard-working commoners to get a ❻ high position in society. Despite the autonomy of each ❼ city-state, they were still linked together through shared systems of ❽ trade and writing.

Unit 3

Theme | *Geography*
Reading Skill | *Main Idea of Each Paragraph*

Wild and Wonderful Alaska

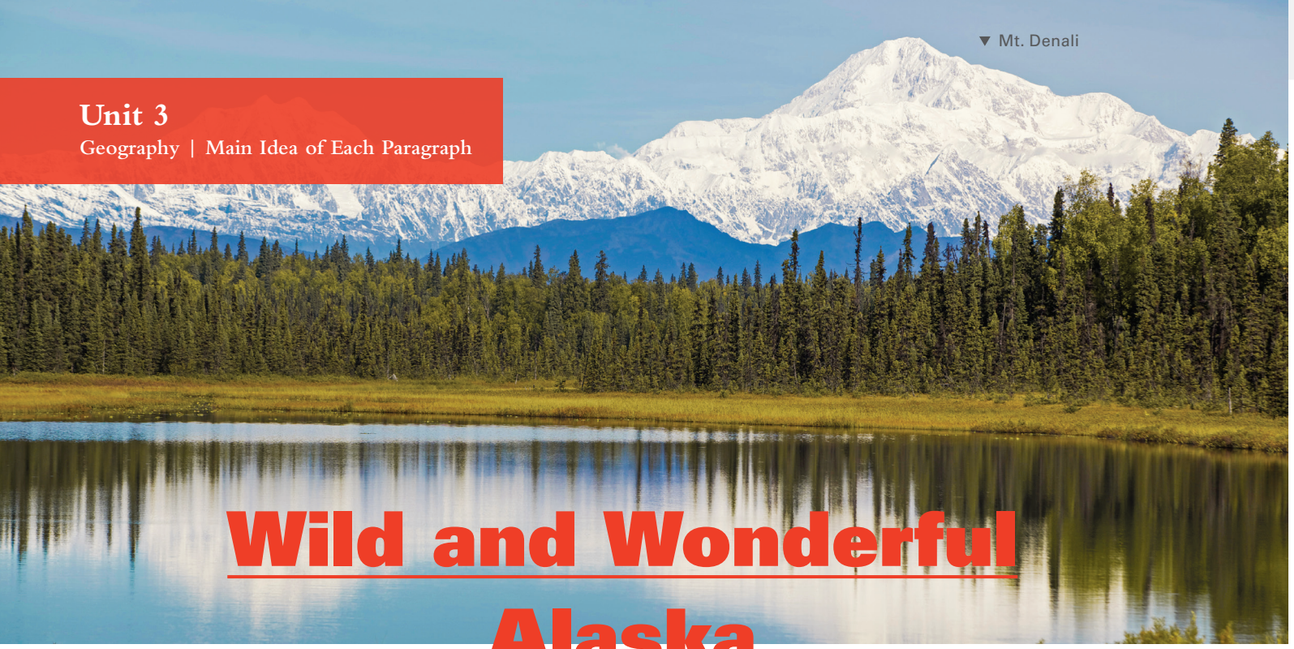
Before You Read

A **Think about the Topic**

1. What is the most unusual or extreme place you have ever visited?
2. How do you think Alaska's culture differs from other parts of the United States?

B **Background Knowledge**

Alaska is by far the largest state in the United States. Purchased from the Russian Empire in 1867, the land became a U.S. state in 1959. Due to its location in the extreme northwestern corner of North America, Alaska has one of the coldest climates anywhere. Despite the severe cold, the state is also home to dozens of native peoples, whose unique cultures go back thousands of years. Alaska is also famous for its incredible natural scenery, including its lakes and mountains, as well as its abundant wildlife.



▼ Mt. Denali

Unit 3
Geography | Main Idea of Each Paragraph

Wild and Wonderful Alaska

▶ *As you read, consider the characteristics of Alaska that make it different from other places.* 03

A lot of people think of the U.S. state of Alaska as a **frigid** place **devoid of** life. The reality is that Alaska is a diverse place **teeming with** life of all types and varieties. This, **coupled with** a unique blend of cultures, makes Alaska one of the most fascinating places on Earth.



Alaska is perhaps most notable for its size. The 49th state covers an area of 1.7 million square kilometers, larger than the next three largest states—Texas, California, and Montana—combined. Despite its tremendous **geographic** size, Alaska is one of the least populated **territories** in the United States, home to just over 700,000 people due to its remote location and generally harsh climate.

While the state's population may not be large, the history of the area is considerable. Evidence shows that the first humans to settle in the Americas arrived in Alaska thousands of years ago by crossing the Bering land bridge which used to connect Alaska to present-day Russia. Today, indigenous Alaskans comprise over 17 percent of the population. The majority of them are Eskimo, Indian, and Aleut. They live in villages scattered along Alaska's coastline and rivers, where they maintain their traditional hunting and fishing lifestyles. Roughly five percent of Alaskans speak one of the 20 indigenous languages, referred to officially as "native languages," as their primary language, including languages such as Inupiaq and Siberian Yupik.

Alaska's natural beauty may be unparalleled. The state is home to more than 3,000 rivers and an incredible three million lakes. Among the 20 tallest mountains in the United States, 17 of them are in Alaska, including the tallest mountain in the U.S., Mt. Denali. There are also more than 10,000 **glaciers** in the state, all of which have unique colorations and appearances. Some of the most famous **ones** include Matanuska and Columbia. Finally, the Aurora Borealis, also called the Northern Lights, is visible in many parts of the state from September through April since there is very little sunlight during that time of year.

If you want to get away from the chaos of urban life and experience **unspoiled** nature, you should visit Alaska. Words 356



▲ Columbia glacier

▲ Aurora Borealis

Reading Skill

*The **main idea of each paragraph** gives a general idea that is explained in the rest of the paragraph.*

Q What is the main idea of the second paragraph?

A Alaska's most significant characteristic is its extremely large ___geographic___ size.

Vocabulary in Context

A **Match the words or phrases in bold from the passage with their correct definitions.**

1. frigid — very cold
2. coupled with — combined with; together with
3. unspoiled — not developed; remaining natural
4. teem with — to be filled with many people or animals
5. territory — an area of land, usually one controlled by a country
6. devoid of — not having something expected; completely lacking
7. glacier — a very large area of ice that slowly moves across land
8. geographic — relating to the natural landscape or features of a place

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word notable in the second paragraph is closest in meaning to _____.
   a. respected b. ordinary c. complicated ✓d. prominent

2. The word indigenous in the third paragraph is closest in meaning to _____.
   a. local ✓b. native c. distinctive d. remarkable

3. The word maintain in the third paragraph is closest in meaning to _____.
   a. honor b. support ✓c. uphold d. justify

4. The word unparalleled in the fourth paragraph is closest in meaning to _____.
   ✓a. incomparable b. unimaginable c. sustainable d. endangered

C **Choose the best word to complete each sentence.**

1. This actor is (notable) / incredible for playing villains in the movies he appears in.
2. A huge number of people from a blend / (variety) of countries visit New York City each year.
3. Russia has the largest (territory) / geography of any nation, covering 17 million square kilometers.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the most popular tourist destinations in Alaska
✓b. the features and characteristics that make Alaska special
c. the natural environmental features that are unique to Alaska
d. a comparison of the largest territories in various parts of the world

Details

2 **Why does Alaska have a relatively low population?**

Its population is low due to its remote location and harsh climate.

3 **According to the passage, which of the following is NOT true about indigenous Alaskans?**

✓a. They speak over 20 different languages.
b. They mostly work as hunters and fishers.
c. They usually live in areas close to water.
d. They make up just over one-sixth of the population.

4 **How did the first humans arrive in Alaska?**

They crossed over the Bering land bridge from what is now known as Russia.

5 **What does the word ones in the fourth paragraph refer to?**

a. colorations b. appearances c. mountains ✓d. glaciers

6 **Which of the following is NOT true according to the passage?**

a. There are more glaciers than rivers in Alaska.
b. The highest mountain in the United States is in Alaska.
c. The Northern Lights are another name for the Aurora Borealis.
✓d. Inupiaq and Siberian Yupik are not considered official “native languages” in Alaska.

Inference

7 **What can be inferred from the passage?**

a. Most indigenous Alaskans do not speak English.
b. Alaska’s population has grown rapidly in recent years.
c. Summer is a good season to see the Aurora Borealis.
✓d. Alaska has more of the tallest mountains than any other U.S. state.

Summary

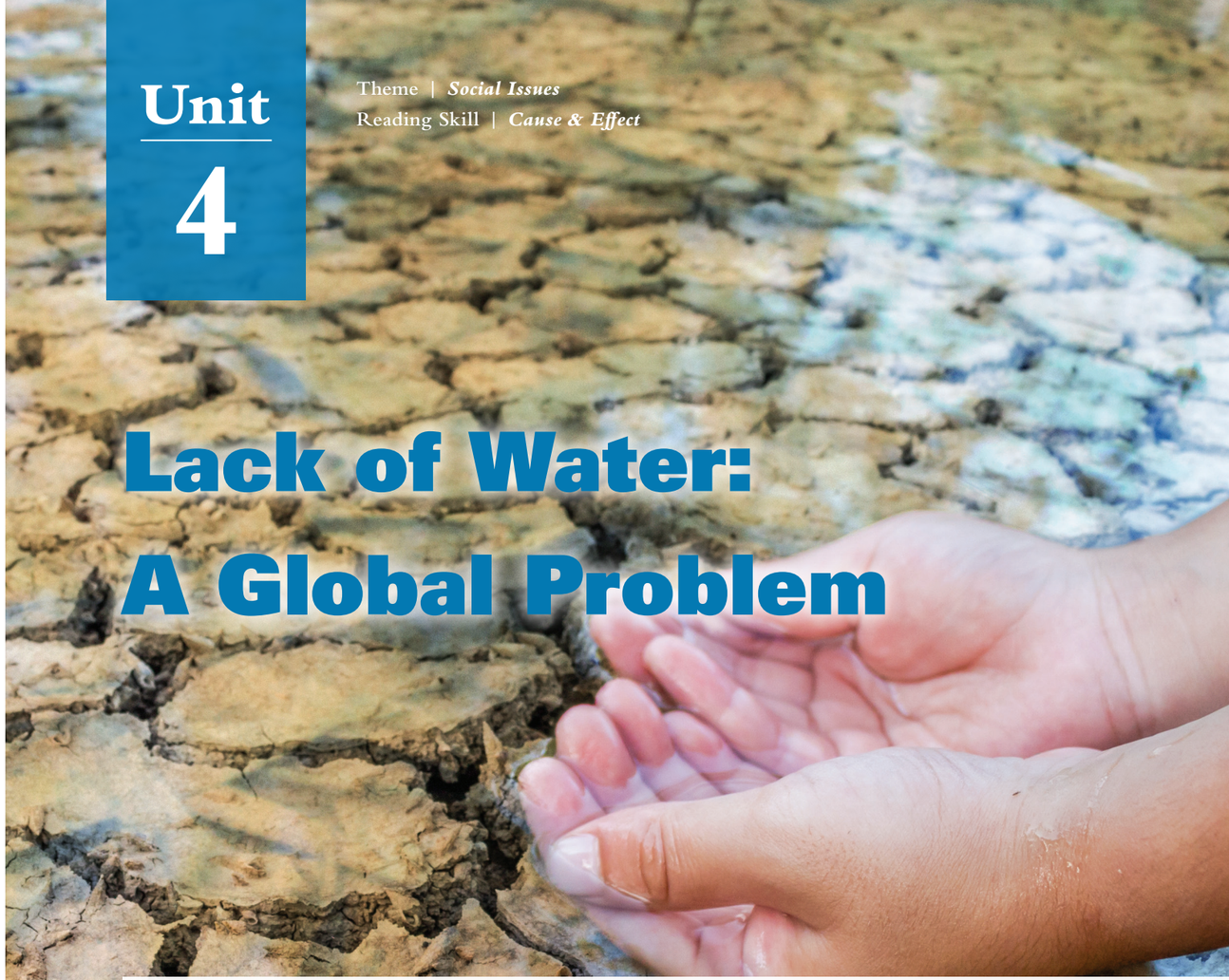
A **Fill in the chart with the phrases in the box.**

Wild and Wonderful Alaska	
Size and Population	• Alaska is 1.7 million square kilometers, which is larger than the next ❶ three largest states combined. • It has one of the ❷ lowest populations of any state due to its remote location and harsh climate.
History	• Humans first ❸ settled in Alaska by crossing the Bering land bridge thousands of years ago. • Indigenous Alaskans still live in villages along the coast, where they maintain their ❹ traditional ways of living. • About five percent of Alaskans speak one of the 20 "native languages."
❺ Natural Beauty	• Alaska is home to thousands of rivers, millions of lakes, 10,000 glaciers, and most of the tallest mountains in the United States. • During the ❻ winter months, the Aurora Borealis is visible.

natural beauty | settled in Alaska | lowest populations
winter months | traditional ways of living | three largest states

B **Complete the summary with correct words by referring to the chart above.**

While Alaska may seem frigid and dull, it is actually one of the most interesting places on Earth. At 1.7 million square kilometers, Alaska is ❶ larger than the next three largest states combined. Despite its ❷ size, the state has one of the ❸ lowest populations in the United States. The first humans ❹ settled in Alaska thousands of years ago by ❺ crossing the Bering land bridge. Indigenous Alaskans still live in villages along Alaska's ❻ coast, where they ❼ maintain their traditional lifestyles. Perhaps the most impressive feature of Alaska is its natural beauty. The state has thousands of rivers and millions of lakes, as well as most of the tallest mountains in the U.S. The Aurora Borealis is also ❽ visible from Alaska during the winter season.



Unit 4

Theme | *Social Issues*
Reading Skill | *Cause & Effect*

Lack of Water: A Global Problem

Before You Read

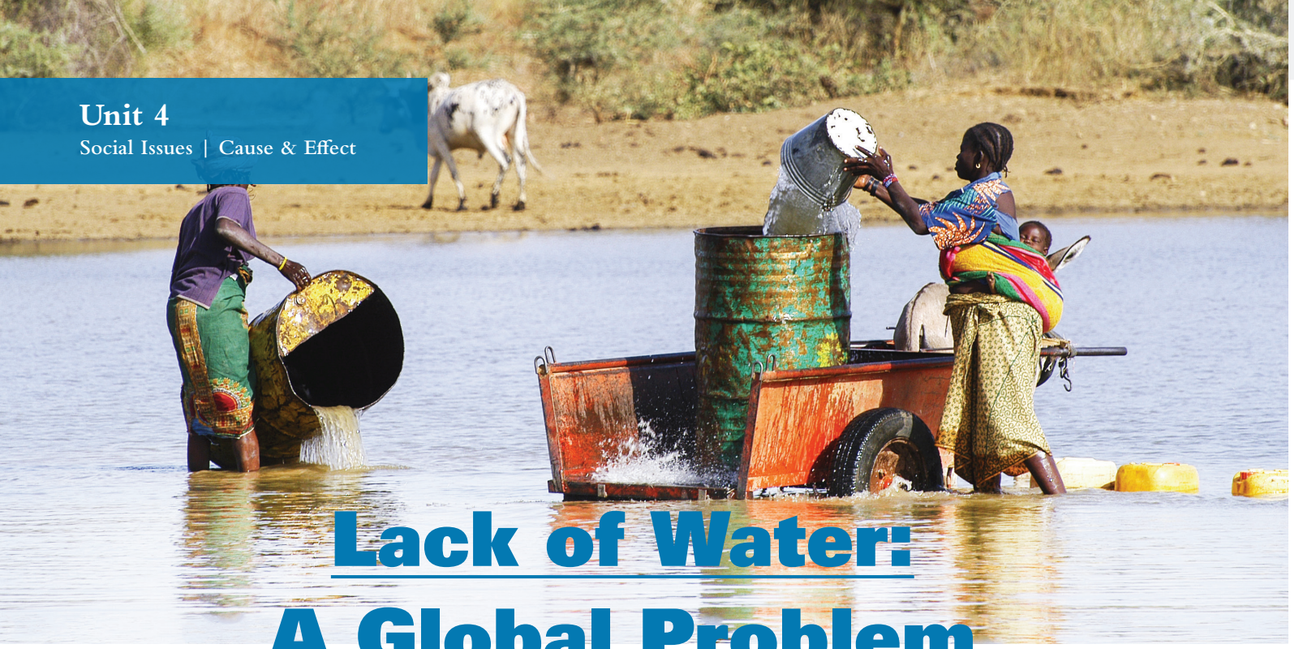


A **Think about the Topic**

1. What are some reasons that people might not have access to clean water?
2. Why is not having access to clean water such a serious problem?

B **Background Knowledge**

Water is essential for survival. Most people can only live three or four days without it. As important as water is, roughly one in ten people globally lack access to clean water. This leads to health problems caused by infections. For young children, not having water is an especially serious problem. An estimated 800,000 children under the age of five die each year due to not having enough water. As the lack of water is a major global problem, there have been several efforts to find solutions for this issue.



Lack of Water: A Global Problem

▶ *As you read, think about how a lack of water affects people's lives and how the problem can be solved.* 04

What do you do when you want to have a drink of water? You probably just turn on your kitchen **faucet** to fill a glass with water anytime you like. For the nearly 800 million people who lack access to clean water, this is an unimaginable luxury. Although the water crisis is a serious problem, it is not without **attainable** solutions.

Water is key to our survival, and without it, life becomes far more difficult. Not having clean water makes people far more susceptible to diseases and illnesses. Consequently, these people are not able to grow food, build homes, get an education, or work. These activities can greatly improve their quality of life. A significant number of the people who lack access to clean water live in Africa. There, many people walk three hours or more each day traveling to their nearest water source. Once they get their water, they must carry home **jugs** weighing up to 30 kilograms. The time and effort spent obtaining water could be better spent working or studying. The United Nations estimates that people in Sub-Saharan Africa alone waste up to 40 billion hours each year **fetching** water.



The water shortage has many culprits. Climate change, overuse, and pollution are all serious causes. But the primary issue is poor water management. Water is increasingly becoming **commoditized** as private corporations purchase water **supplies** and resources with the intention of selling it at a profit. Because clean water is not always free, millions of the world's impoverished people must **do without it**. For instance, people in Papua New Guinea, Madagascar, and other developing nations spend up to half of their incomes to obtain safe drinking water. This happens because they lack access to public water supplies and must rely on **privatized** water sources.



The good news is that several solutions for the scarcity problem exist. In many countries, people have worked to halt the privatization of water in their countries. Major global organizations are also working to address the water management problem. One of the most notable is the United Nations, which has developed the Integrated Water Resource Management (IWRM) plan. The goal of the plan is to maximize water usage efficiency so that all people around the globe can have access to the water they need to survive. Words 383

Reading Skill

Cause and effect is when one event causes something to happen. The cause explains why something happens, and the effect is what happens as a result.

Q Why do some people in developing nations spend so much of their income on drinking water?

A Because they lack access to _____public_____ water supplies and need to rely on _____privatized_____ water sources

Vocabulary in Context

A **Match the words or phrases in bold from the passage with their correct definitions.**

1. attainable — able to be accomplished or achieved
2. fetch — to go to a place and to bring back something
3. jug — a large container with a handle for pouring liquids
4. supply — an amount of something that is available for use
5. do without — to live without something usually considered necessary
6. privatize — to make something change from public to private ownership
7. commoditize — to make something become a product that is sold by businesses
8. faucet — a device that controls the amount of water coming out of a water line

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word key in the second paragraph is closest in meaning to _____.
   ✓a. vital b. minor c. influential d. considerable

2. The word culprit in the third paragraph is closest in meaning to _____.
   a. solution ✓b. source c. punishment d. purpose

3. The word intention in the third paragraph is closest in meaning to _____.
   a. profit b. distinction c. method ✓d. ambition

4. The word halt in the fourth paragraph is closest in meaning to _____.
   a. inject b. drive ✓c. prevent d. fail

C **Choose the best word to complete each sentence.**

1. As oil runs out, we will have to develop alternative suppliers / sources of energy.
2. Your dream to be the world's richest person is not really attainable / affordable.
3. The city's intention / solution for building the amusement park is to attract more tourists.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the effect that water has on our health and quality of life
b. successful and unsuccessful attempts to distribute water equally
c. countries where impoverished people cannot afford to have water
✓d. the problems caused by not having clean water and possible solutions

Details

2 **According to the passage, what is NOT a problem caused by a lack of clean water?**

a. not being able to raise crops
✓b. collecting water from local sources
c. having less time to spend working or studying
d. not being able to prevent diseases and illnesses

3 **What do many people in Africa do to get clean water?**

They walk three or more hours every day to get to their nearest water source.

4 **What does the word it in the third paragraph refer to?**

✓a. clean water b. water management c. supply d. corporation

5 **Why are companies commoditizing water resources?**

They want to sell water at a profit.

6 **Which of the following is NOT true according to the passage?**

a. Water privatization has caused water shortages.
b. Having clean water is linked to experiencing a higher quality of life.
✓c. The Integrated Water Resource Management plan has reached its goals.
d. Many people in Sub-Saharan Africa do not go to school or work since they have to fetch water.

Inference

7 **What can be inferred about water privatization?**

✓a. It is being opposed by people in various places.
b. It will be stopped by major global organizations.
c. It is not as serious an issue as climate change and pollution.
d. It has the main purpose of denying water to impoverished people.

Summary

A **Fill in the chart with the phrases in the box.**

Lack of Water	
The Necessity of Water	• People need water to maintain a ❶ high quality of life. • In Africa, people waste countless hours ❷ fetching water every day.
Causes of Water Scarcity	• It is partially caused by climate change, overuse, and pollution. • The main reason for water scarcity is the ❸ commoditization of water. • Private corporations are privatizing water supplies with the intention of selling water ❹ at a profit.
Solutions for the Scarcity Problem	• In many countries, people are working to ❺ halt the privatization of water. • Organizations such as the UN have made plans to maximize ❻ water usage efficiency.

fetching water　high quality of life　water usage efficiency
at a profit　commoditization of water　halt the privatization

B **Complete the summary with correct words by referring to the chart above.**

Almost 800 million people globally lack ❶ access to clean water. This is a major problem, but there are ❷ attainable ways to solve it. People need clean water to improve their ❸ quality of life. Unfortunately, many people in Africa waste many hours each day collecting water. This time could be better spent working or ❹ studying. Water is in short ❺ supply for many reasons, but perhaps the main reason is that it is being ❻ commoditized. Private corporations are selling water, forcing the world's ❼ impoverished people to do without it. Fortunately, major global organizations such as the United Nations have created plans to ❽ maximize water usage efficiency so that people everywhere can have access to the water they need.



Before You Read

A **Think about the Topic**

1. What strategies do you think businesses use to sell more products?
2. How do you think loss leader pricing strategies work?

B **Background Knowledge**

We live in a society where businesses must compete to get as many customers as possible. This has led to the development of numerous strategies by companies to make their products more appealing to consumers. Oftentimes, this involves giving discounts to customers. There is also one strategy that involves selling products for less than what they cost to make. This is referred to as the loss leader pricing strategy. While it does not allow businesses to make money on each product being sold, it can help them make more money in other ways. However, the loss leader strategy is risky, and as a result, it is used in only certain circumstances.



Loss Leader Pricing Strategy

▶ *As you read, consider the situations in which businesses would use the loss leader pricing strategy.* 05

The goal of every business is simple: make as much money as possible. Sometimes, however, businesses employ a different strategy. Rather than maximizing their profits on a product, manufacturers or **retailers** will choose to lose money on each item sold. In other words, they will sell an item at a cost lower than the total cost of manufacturing and distributing each unit of a product. This is referred to as loss leader **pricing**, and while it may seem **counterintuitive**, it can be beneficial in certain situations.



Loss leader pricing is often used to make a product more appealing to customers. Stores will often sell products at extremely low prices to lure customers. They hope that the customers will purchase other, more profitable items during their shopping trip along with the loss leader product. Companies will also sell new products at below cost to **establish** them more quickly among a wider number of consumers. Once a market for the item becomes more established, the manufacturer will generally raise prices to profit-making levels.

Another situation in which companies will sell below cost is when a product requires **complementary** products to be used. For instance, computer printers are often sold more cheaply than they cost to make. This is possible because the printers require regular ink refills, and the ink is sold for a much greater profit than the printers are. Analysts state that ink cartridges are sold at a 20 to 30 percent profit margin.

While below-cost selling can help a company sell a lot of its products quickly, it is not a **viable** strategy in the long term. For one, there is always a risk of loss. Consumers may only buy the loss leader product and not more profitable products. Consequently, companies might make no profit or might even lose money. Another potential problem is **stockpiling**, where consumers purchase huge quantities of the loss leader product and store them for later use. The best way to avoid this is to limit the amount of each item that customers may buy. There is also the issue of price **perception**, which can occur when a product is sold below cost for too long of a time. This can lead consumers to think that a product should have a low price all the time. Words 380



Reading Skill

*The **main idea of each paragraph** gives a general idea that is explained in the rest of the paragraph.*

Q What is the main idea of the fourth paragraph?

A The loss leader pricing strategy is not practical in the long term although it helps businesses sell a lot of products quickly.

Vocabulary in Context

A **Match the words in bold from the passage with their correct definitions.**

1. viable — capable of being used or done; practical
2. stockpile — to get and keep something for future use
3. pricing — the act of deciding how much something costs
4. complementary — completing something else or making it useful
5. perception — the way you think about and understand something
6. establish — to make something become well known and common
7. retailer — a person or company that sells products directly to the public
8. counterintuitive — different from what you would expect; seeming to be illogical

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word employ in the first paragraph is closest in meaning to _____.
   ✓a. use b. hire c. consider d. preserve

2. The word lure in the second paragraph is closest in meaning to _____.
   a. stimulate b. trap ✓c. attract d. invite

3. The word profitable in the second paragraph is closest in meaning to _____.
   a. favorable b. harmonious c. detectable ✓d. lucrative

4. The word potential in the fourth paragraph is closest in meaning to _____.
   ✓a. possible b. available c. particular d. proven

C **Choose the best word to complete each sentence.**

1. Luxury products are made to be of the highest quantity / quality.
2. The best way to maximize / minimize your work efficiency is to break your tasks into smaller parts.
3. New businesses rarely make money at first, but they must become viable / profitable if they are to survive in the long term.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. situations where selling below cost is always beneficial
b. a new type of selling strategy being used by some retailers
✓c. a pricing method in which products are sold at less than their value
d. items that are commonly sold using the loss leader pricing strategy

Details

2 **What does the word They in the second paragraph refer to?**

✓a. stores b. customers c. products d. low prices

3 **Which is NOT a situation where companies will use the loss leader strategy?**

a. a company offering an item at below cost to raise awareness about the product quickly
✓b. a store reducing the price of an item so that customers will always expect the price to be low
c. a retailer attracting customers with a loss leader item to encourage them to purchase other items
d. a manufacturer selling a product cheaply since it sells other products that go with it at higher profits

4 **How can companies sell computer printers for less than they cost to make?**

Because customers will need to purchase ink, which is sold for a much greater profit than the printers

5 **According to the passage, how can selling below cost cause companies to lose money?**

a. Consumers might refuse to pay the listed price of a product during a sale.
b. Consumers might have a negative perception of products sold at too low of a price.
c. Customers may return the item for a refund because a cheap product has poor quality.
✓d. Customers may not purchase more profitable products along with loss leader products.

6 **What can companies do to overcome the problem of stockpiling?**

They can limit the amount of each item that customers may buy.

Inference

7 **What can be inferred from the passage?**

a. Below-cost selling is generally used by larger companies only.
✓b. Businesses usually use the loss leader strategy for a short time.
c. Companies cannot raise the price of a loss leader product later.
d. Newly released products are never sold using the loss leader strategy.

Summary

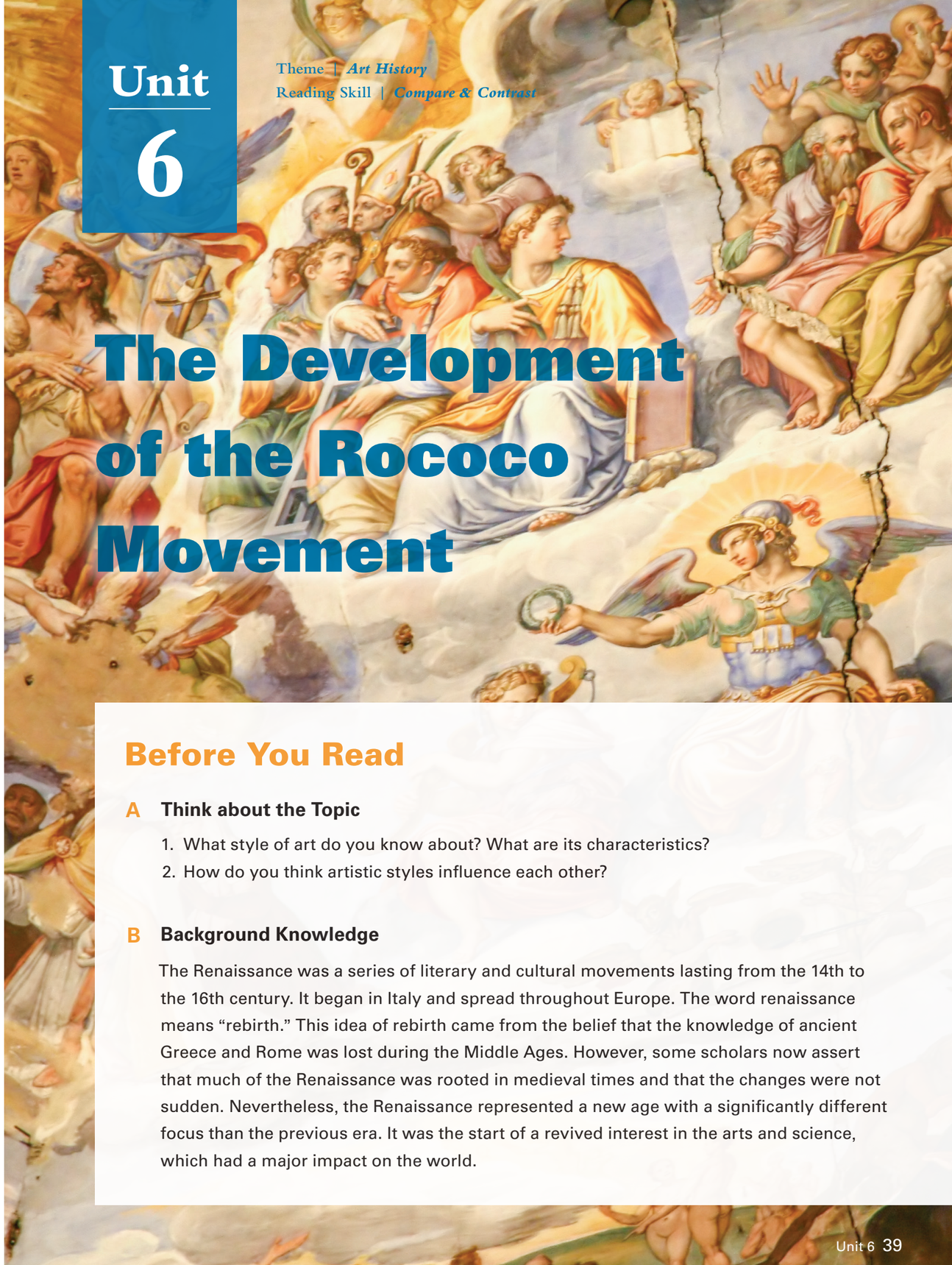
A **Fill in the chart with the phrases in the box.**

The Loss Leader Pricing Strategy	
Loss Leader Pricing	This is the strategy of selling a product for less than what it costs to ❶ manufacture and distribute it.
When It Is Used	• Stores use it to attract customers in the hope that they will buy more ❷ profitable products. • Companies will use it to ❸ create markets for new products quickly. • It is used with products that need ❹ complementary products.
When It Can Be Harmful	• Companies can lose money when customers only buy loss leader products. • People can also purchase many loss leader products and ❺ stockpile them for later. • Customers may come to believe that the product should always ❻ have a low price.

profitable products　stockpile them　manufacture and distribute
create markets　have a low price　complementary products

B **Complete the summary with correct words by referring to the chart above.**

The loss leader pricing strategy refers to a business selling a product for ❶ less than what it costs to make and distribute it. Stores will ❷ attract customers with loss leader products, hoping that they will purchase more ❸ profitable items during their shopping trip. New products will also be sold below profit-making levels to help ❹ establish them quickly. Companies will also use the loss leader strategy with products that require ❺ complementary products, such as printers which require ink. Although the loss leader strategy can sell many products quickly, there are potential ❻ risks. Companies can ❼ lose money if people only buy loss leader products. Customers may also ❽ stockpile the product or think that the product should always have a low price.



Unit 6

Theme | *Art History*
Reading Skill | *Compare & Contrast*

The Development of the Rococo Movement

Before You Read

A **Think about the Topic**

1. What style of art do you know about? What are its characteristics?
2. How do you think artistic styles influence each other?

B **Background Knowledge**

The Renaissance was a series of literary and cultural movements lasting from the 14th to the 16th century. It began in Italy and spread throughout Europe. The word renaissance means “rebirth.” This idea of rebirth came from the belief that the knowledge of ancient Greece and Rome was lost during the Middle Ages. However, some scholars now assert that much of the Renaissance was rooted in medieval times and that the changes were not sudden. Nevertheless, the Renaissance represented a new age with a significantly different focus than the previous era. It was the start of a revived interest in the arts and science, which had a major impact on the world.



Catherine Palace,
a Rococo Palace in Russia ▶

Unit 6
Art History | Compare & Contrast

The Development of the Rococo Movement

▶ *As you read, pay attention to how the Rococo style differed from Baroque.* 06

The Baroque period started around 1600 in Rome, Italy, and developed in response to the Renaissance. Baroque gets its name from the Portuguese word *barroco*, meaning "pearl." It is characterized by the use of **elaborate** techniques or thematic **extravagance**. As Baroque grew in popularity, another art movement, which became known as Rococo, arose. There is no argument about how important Baroque was for Western art. However, art historians are split over Rococo's influence on Western culture. Some believe that the style was merely a brief reaction to Baroque while others argue that it has had a much deeper impact.

By the end of the 17th century, Baroque art was immensely popular throughout Europe. King **Louis XIV** declared it the official style of France. He designed the Palace of Versailles entirely in this style. Anti-monarchists, tired of the king's excesses, strove for a simpler style. Rococo was born as a conscious turn away from Baroque and used strikingly different **motifs**.

At first, Rococo was only focused on architectural design. Artists frequently used "s" curves and "c" *scrolls with naturalistic motifs from shells and plants. This was a stark contrast to the passionate Baroque style that decorated the king's palace. Baroque works also frequently relied upon Biblical **references**. They emphasized drama with the use



▲ St. Johns Co-Cathedral decorated in the Baroque style



▲ The interior of Rundale Palace decorated in the Rococo style

of dark colors and intense shadows. Rococo, in contrast, removed the tension and used mirrors and light colors visually to open up rooms.

Rococo artworks reflected this ideal as well. The themes were generally light and playful, and the subject matter included leisurely outings or myths of love. Rococo was **set apart** by its inclusion of Oriental designs and **asymmetric** compositions. In comparison, Baroque works were carefully styled. Artists such as Bernini sculpted **busts** and figures that displayed careful attention to balance.

The refusal of Rococo artists to address more serious themes is the main reason that some scholars do not take the Rococo movement seriously. Many art historians feel that to have a significant impact on culture, art has to be more **profound**, like Baroque. Yet there are those who feel that Rococo's importance is just as great as Baroque's. Words 353

*scroll: a decoration that has curves at the end



▲ *Neptune and Triton* sculpture by Bernini

Reading Skill

Comparing and contrasting is a way to explain how two or more things are similar and different.

Q How were Baroque architecture and Rococo architecture different?

A Baroque architecture relied on _____dark_____ colors and shadows whereas Rococo utilized _____mirrors_____ and light colors to make rooms more open.

Vocabulary in Context

A Match the words or phrases in bold from the passage with their correct definitions.

1. elaborate — rich in detail
2. profound — showing a deep understanding
3. extravagance — the state of being fancy or luxurious
4. reference — the act of looking at something for information
5. asymmetric — having two parts or sides that are not the same
6. bust — the upper part of the human figure in a sculpture
7. motif — a pattern or shape that is repeated in a design
8. set apart — to have a quality that makes something different or better than others

B Look at the underlined words in the passage and choose the correct answers.

1. The word immensely in the second paragraph is closest in meaning to _____.
   a. intentionally b. oddly ✓c. extremely d. reportedly

2. The word stark in the third paragraph is closest in meaning to _____.
   ✓a. great b. gloomy c. occupied d. harsh

3. The word outing in the fourth paragraph is closest in meaning to _____.
   a. drama b. excess c. theme ✓d. picnic

4. The word address in the fifth paragraph is closest in meaning to _____.
   a. balance b. ignore c. develop ✓d. treat

C Choose the best word to complete each sentence.

1. The artist's motif / motive for creating this painting was to honor his mother.
2. Although the left and right halves of your body look the same, they are actually asymmetric / balanced.
3. The new version of this software program is quite elaborate / extravagant and has a lot of specific features.

Reading Comprehension

Main Idea

1 What is the passage mainly about?

a. the influence of Rococo on Baroque
b. the most important Western art movements
✓c. the differences between two styles of art
d. the impact of Oriental designs on Western art

Details

2 Which of the following is NOT true about Baroque art?

a. It included careful attention to balance.
✓b. It used myths of love as inspiration.
c. It represented events from a religious text.
d. It is considered an important art movement by everyone.

3 Why does the author mention Louis XIV in paragraph 2?

a. to mention an artist famous for Baroque works
b. to criticize the king for his extravagant lifestyle
✓c. to illustrate the widespread popularity of Baroque
d. to offer an opposing view about the impact of Baroque

4 According to the passage, what was Rococo focused on at first?

It was focused on architectural design.

5 Which of the following is true about Rococo works?

a. They were more religious than Baroque ones.
b. They used light colors in addition to dark ones.
✓c. They used different types of curved lines in their designs.
d. They incorporated natural materials into their construction.

6 Why do some historians look down on the Rococo art movement?

Because Rococo artists refused to address more serious themes

Inference

7 What can be inferred from the passage?

a. Rococo started in the early 17th century.
✓b. Rococo artists were unhappy with the king's wastefulness.
c. The Rococo movement was never respected by art scholars.
d. The development of Rococo is closely linked to the end of the Renaissance.

Summary

A **Fill in the chart with the phrases in the box.**

Baroque vs. Rococo	
Baroque	• It developed in response to ❶ the Renaissance. • It was known for its ❷ elaborate style. • It frequently used religious themes. • It emphasized ❸ dark colors and drama. • Its artworks showed balance.
Rococo	• It was a move away from Baroque. • It had ❹ curved lines with themes taken from nature. • Rococo works were ❺ light and playful. • It incorporated Oriental and ❻ asymmetric designs.

curved lines	elaborate style	light and playful
the Renaissance	dark colors	asymmetric designs

B **Complete the summary with correct words by referring to the chart above.**

During the Renaissance in Italy, a new art ❶ movement called Baroque was developed. As Baroque became more popular, another art movement, Rococo, grew in response. Baroque works are characterized by their elaborate style and ❷ religious themes. They are also known for their dramatic use of dark colors and heavy ❸ shadows. Another characteristic is the emphasis on ❹ balance of forms. In ❺ contrast, Rococo was intended to be a lighter and more playful style. ❻ Subject matters such as picnics and love were common, as was the use of mirrors and brighter colors. Unlike the balanced forms of Baroque, Rococo pieces were asymmetric and used ❼ curved lines. Today, art historians debate Rococo's importance to ❽ Western culture.

Unit 7

Theme | *Technology*
Reading Skill | *Main Idea of Each Paragraph*

The Rise of Drone Technology

Before You Read

A **Think about the Topic**

1. What do you think drones were originally developed for?
2. Do you think technology such as drones makes people's lives more or less private?

B **Background Knowledge**

A drone is an aircraft that does not have people on board controlling it. The idea behind drones is not new. The first recorded use of an air weapon without a pilot was in 1849, when Austria launched balloons carrying bombs to attack Italy. But the development of modern drones did not begin more seriously until World War II, when the American and Japanese militaries experimented with planes that could fly without people inside. By the Vietnam War, the U.S. had developed a drone plane that could be used to spy on enemy soldiers. Since then, drone technology has become more advanced and less expensive. Now, it is possible for the average person to have his or her own drone.



The Rise of Drone Technology

▶ *As you read, compare the advantages of using drones to the possible disadvantages.* 07

For over seventy years, different militaries have used drone technology in aircraft. These **unmanned** planes were first used in missions that were considered too risky or dangerous for human pilots to undertake. In recent years, drone technology has become more **affordable**, and almost anyone can have his or her own remote controlled flying machine. The increased popularity of drones has brought clear benefits, but not without some notable drawbacks.

Drone technology is being applied to help with animal **conservation**. For instance, scientists working to protect the Sumatran orangutan in Malaysia are using drones to map the creature's habitat. This process was difficult and costly before the use of drones. In Ottawa, Canada, officials are using drones to frighten away geese to protect other animals. Along the Ottawa River, geese control nearly all the beach land and attack other animals that try to approach. With their GooseBuster, a drone fitted with speakers that play the howls of gray wolves, officials in Ottawa have been able to scare away the geese so that other animals may **thrive**.



The field of **meteorology** also benefits from drones. Scientists at NASA and other agencies are working to develop drones that can fly directly into the centers of hurricanes, tornados, and other severe storms. By studying these storms up close, far closer than what is possible with **piloted** aircraft, scientists hope to get a better understanding of **them** and make better predictions about their impacts.

Not everyone has positive opinions about drones. **Arguably** the greatest concern associated with them is their impact on personal privacy. As drone technology becomes more affordable and user friendly, it will become increasingly simple for people to use drones for spying. Drones can be equipped with **high-resolution** cameras that can be used to record images of people in their private moments. A related concern is hacking and how criminals could take control of drones. They could use drones to commit crimes such as gathering information illegally or simply ruining the drones by crashing them.



Although drone technology offers many benefits to our lives, it must be regulated carefully so it is used for our benefit, not for our harm. Words 358

Reading Skill

*The **main idea of each paragraph** gives a general idea that is explained in the rest of the paragraph.*

Q What is the main idea of the fourth paragraph?

A People are concerned about _____privacy_____ and hacking as drone technology is used more and more.

Vocabulary in Context

A **Match the words in bold from the passage with their correct definitions.**

1. unmanned — not having people on board
2. meteorology — the scientific study of weather
3. thrive — to grow or develop successfully
4. piloted — controlled by a person who is on board
5. affordable — easily able to purchase; not expensive
6. high-resolution — being able to show images clearly with many details
7. arguably — used to say that a statement is very possibly true
8. conservation — the protection of animals, plants, or other natural resources

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word undertake in the first paragraph is closest in meaning to _____.
   a. recover ✓b. manage c. agree d. undergo

2. The word costly in the second paragraph is closest in meaning to _____.
   ✓a. expensive b. valuable c. closely d. affordable

3. The word frighten in the second paragraph is closest in meaning to _____.
   a. assure b. distract c. frustrate ✓d. startle

4. The word ruin in the fourth paragraph is closest in meaning to _____.
   a. collapse ✓b. destroy c. reveal d. disapprove

C **Choose the best word to complete each sentence.**

1. When presented with an opportunity, you must thrive / strive to make the most of it.
2. Researchers are applying / supplying 3D printing technology to make medical treatments cheaper.
3. The main goal of the group is the conservation / reservation of the beach and surrounding land.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. why drones have become more affordable in the past few years
b. the ways in which drone technology has benefited the military for decades
✓c. the potential benefits and consequences of a technology's widespread use
d. how a technological advancement is making life better for people around the world

Details

2 **According to the passage, how are officials using drones in Canada?**

a. to map the territory of an endangered species
b. to frighten gray wolves away from the Ottawa River
✓c. to protect animals threatened by aggressive animals
d. to help save money for animal conservation efforts

3 **What is the main benefit of drones for researchers protecting the Sumatran orangutan in Malaysia?**

They help them to more easily and cheaply map the habitat of the orangutan.

4 **What does the word them in the third paragraph refer to?**

✓a. these storms b. predictions c. drones d. scientists

5 **Why are meteorologists developing drones that can fly into the centers of storms?**

So they can better understand the storms and make better predictions about their possible impacts

6 **Which of the following is NOT mentioned as the possible problems of drones?**

a. People could hack drones and use them to collect information illegally.
b. Spying will become more common as drones become easier to use.
c. Drones could be used to take photographs of people who are alone.
✓d. Drones might be used to crash into people's homes and steal their valuables.

Inference

7 **What can be inferred from the passage?**

a. Drones are mainly used to rescue animals from predators.
b. Drones have to be equipped with cameras and speakers.
c. It is necessary to use drones to determine where some animals live.
✓d. Drone technology is likely to become more affordable in the future.

Summary

A **Fill in the chart with the phrases in the box.**

The Rise of Drone Technology	
Benefits for Animal Conservation	• Animal conservationists are using drones to ❶ map the habitat of Sumatran orangutans in Malaysia. • Canadian officials are using drones to ❷ scare away geese that threaten other animals along the Ottawa River.
Benefits for Meteorologists	• Weather scientists want to use drones to ❸ fly directly into hurricanes and other severe storms. • This will help them to better understand the storms and to make more ❹ accurate predictions about their impacts.
Possible Problems	• Drones may lead to ❺ an invasion of privacy as it is easy for someone to spy on other people. • Hackers could also use drones to commit ❻ illegal activities.

scare away　　map the habitat　　accurate predictions
illegal activities　　an invasion of privacy　　fly directly into

B **Complete the summary with correct words by referring to the chart above.**

Thanks to improvements in technology, drones have become much more ❶ affordable. This offers major advantages in the area of animal ❷ conservation. Drones are being used to ❸ map the habitat of Sumatran orangutans in Malaysia. Officials in Canada are using drones to scare away geese that attack other animals along the Ottawa River. ❹ Meteorologists are also taking advantage of drones. They are hoping to use drones to fly ❺ directly into hurricanes and other severe storms to make better ❻ predictions about their impacts. ❼ However, there are downsides to drones. One worry is that they could be used to spy on people. There is also the threat of hackers taking control of drones to ❽ commit crimes.

Unit 8

Theme | *Psychology*
Reading Skill | *Main Idea of Each Paragraph*

Understanding Behavior Through the MBTI

Before You Read

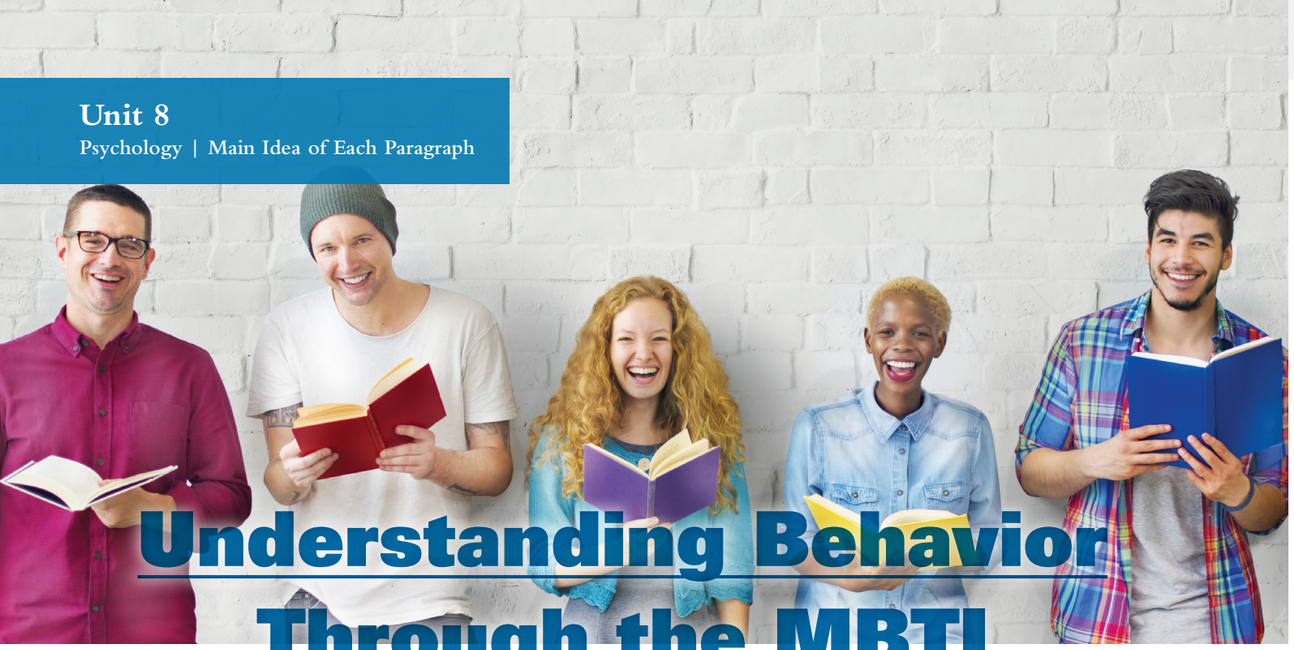
A **Think about the Topic**

1. Do you think that a test can tell you about someone's personality?
2. Do you think that certain personalities are suitable for certain jobs?



B **Background Knowledge**

Carl Jung was born in 1875 in Switzerland. Today, he is considered one of the most important figures in the field of psychology. He developed many important concepts in psychology, but he is perhaps best remembered for his concept of individuation. This is the idea that people create a unique identity for themselves over the course of their lives as a result of their personality traits and experiences. His ideas about how our behavior shapes our personality are the basis for today's most well-known personality test, the Myers-Briggs Type Indicator (MBTI).



Understanding Behavior Through the MBTI

▶ *While you read, pay attention to the way that the unconscious affects our personality.* 08

Early psychologists used a variety of tests to try to understand the human mind. The process of understanding how our minds work became simpler in the mid-1900s when a new type of standardized test appeared. The Myers-Briggs Type Indicator (MBTI) was designed to measure the temperament, or personality, of individuals. This test was based upon the work of Carl Jung, the famous **psychiatrist**. Jung believed that to understand people's behavior, scientists have to take into account dreams and other nonscientific knowledge. His theory of human personality is based upon the **interaction** between a person's **conscious** and unconscious minds.



One way that Jung believed that the unconscious affected people is through **complexes**. A complex develops from events in childhood. Jung proposed that a complex is the source of behavior that is unusual or difficult to explain. The two main types of complexes are the male and female. These are the **preconceived** ideas of gender. For instance, a woman who is constantly exposed to negative **depictions** of men as a child will carry these feelings with her into adulthood. Even if her adult idea of the male is positive, through her actions, she will show her discomfort with men. In addition, Jung also described complexes that are related to people's ages and social classes.

To learn more about a person's complexes, Jung used word **association** tests. These are when a patient is given random words and asked to respond to **them** with the first word that comes to mind. Using these responses, Jung analyzed his patients' personalities. More interestingly, Jung found that there were patterns among his patients. He called the different categories "**archetypes**." While the number of archetypes is unlimited, there are a number of common ones. These include the mother figure, the father figure, the wise old man, the joker, and others. For instance, the Great Mother is an idealized maternal figure, who is caring, compassionate, and dependable.

The MBTI categorizes people in a similar fashion. Most modern tests list people as belonging to one of 16 different groups. However, there are some researchers who feel that classifying people in this way is not appropriate. Yet a number of counselors feel that it is beneficial. With this knowledge, people are able to choose careers that best fit their personalities. Words 380

Reading Skill

*The **main idea of each paragraph** gives a general idea that is explained in the rest of the paragraph.*

Q What is the main idea of the second paragraph?

A Complexes that develop from childhood events explain behavior that is unusual or difficult to explain.

Vocabulary in Context

A **Match the words in bold from the passage with their correct definitions.**

1. conscious — aware of what is happening around you
2. archetype — a perfect or typical example of something
3. psychiatrist — a doctor who studies mental illnesses
4. preconceived — formed too early, without enough knowledge or thought
5. association — a feeling or a memory that is connected to something or someone
6. complex — an emotional problem that causes people to think or worry too much
7. depiction — the act of describing or showing something in words or a picture
8. interaction — the way two or more things come together and affect each other

B **Look at the underlined words or phrases in the passage and choose the correct answers.**

1. The phrase take into account in the first paragraph is closest in meaning to _____.
   a. diversify ✓b. consider c. accept d. ignore

2. The word source in the second paragraph is closest in meaning to _____.
   a. description ✓b. root c. result d. material

3. The word compassionate in the third paragraph is closest in meaning to _____.
   a. passionate b. unfriendly ✓c. sympathetic d. comparable

4. The word fashion in the fourth paragraph is closest in meaning to _____.
   ✓a. manner b. trend c. process d. analysis

C **Choose the best word to complete each sentence.**

1. Luke Skywalker in *Star Wars* is the archetype / imitation of a movie hero.
2. My boss relies on me because I am a dependable / dependent employee.
3. The artist's reception / depiction of the event was not completely accurate in her painting.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the role of Jung in modern psychology
b. the differences between Jung's archetypes
c. the influence of complexes on human behavior
✓d. the basis of a test that measures human traits

Details

2 **According to the passage, what did Jung base his theory on?**

a. the work of the Myers-Briggs Type Indicator
b. the results of a series of tests on young children
c. previously known archetypes of human personalities
✓d. the relationship between people's conscious and unconscious minds

3 **What role does a complex play in a person's behavior?**

A complex is the source of a person's unusual behavior.

4 **In the passage, which of the following is NOT mentioned as a complex by Jung?**

a. how old a person is
b. what a person's gender is
✓c. where a person grew up
d. what a person's social status is

5 **What does the word them in the third paragraph refer to?**

a. complexes ✓b. tests c. patterns d. personalities

6 **How did Jung create his idea of archetypes?**

He noticed patterns among the personalities of his patients.

Inference

7 **What can be inferred about the MBTI from the passage?**

a. It is always used by college counselors.
b. It had a significant influence on Jung's work.
✓c. It is a source of disagreement among professionals.
d. It no longer has any support among the scientific community.

Summary

A **Fill in the chart with the phrases in the box.**

Jung's Archetypes and the MBTI	
The MBTI	• It is a standardized test to measure the ❶ personality of individuals. • It was based on Jung's concept of the conscious and ❷ unconscious minds.
Complexes	• Complexes can explain unusual behavior. • The main complex of people is their ❸ preconceived ideas of gender, and there are important complexes related to ages and ❹ social classes.
Personality Archetypes	• Word association tests could show a patient's personality, and Jung ❺ used patterns in patients' answers to create archetypes. • The most common archetypes include the mother figure, the father figure, the wise old man, and the joker.
Opinions about the MBTI	• Some researchers feel that ❻ classifying people is not appropriate. • Others believe that MBTI classifications can help people choose careers.

unconscious minds　classifying people　social classes
preconceived ideas　used patterns　personality of individuals

B **Complete the summary with correct words by referring to the chart above.**

The Myers-Briggs Type Indicator is based upon the work of Carl Jung and analyzes people's ❶ personalities. Jung proposed that ❷ unusual behavior can be explained by complexes. The main complex people have is ❸ gender, but a person's social status and ❹ age are also complexes. Using word ❺ association tests, Jung was able to analyze patients' personalities. Due to the commonality of people's personalities, Jung grouped them into ❻ archetypes. A common one is the Great Mother. While people today use MBTI tests to place people into different groups, there is debate as to how ❼ appropriate it is to ❽ categorize(classify) people.

Unit 9

Theme | *Environment*
Reading Skill | *Cause & Effect*

The Problem of Ultrafine Particles

Before You Read

A **Think about the Topic**

1. What are some potential causes of health problems that people are exposed to each day?
2. How do you think ultrafine particles differ from other types of air pollution?

B **Background Knowledge**

Dust particles are a natural part of our environment. The wearing away of soil creates dust, and so do flowers releasing pollen. Dead skin cells are another source of dust. While breathing in dust can be harmful to our health, our bodies have natural defenses against dust. The hairs in our nose stop larger dust particles from entering the body, and the liquid in our throats and lungs takes care of most other dust. However, there are some particles that are too small for our bodies to defend against. They are ultrafine dust particles, and they may lead to serious problems in the future if we do not work now to stop them.



The Problem of Ultrafine Particles

▶ *As you read, pay attention to where ultrafine particles come from and how they can affect our health.* 09

Ultrafine **particles** (UFPs) are the smallest and most dangerous pollution particles in the air. Both naturally occurring and manmade, UFPs pose the greatest risk to people in densely populated areas. Technologies and **legislation** are already in place to help curtail the problem of fine particles. However, little has been done to address the problem of UFPs.

Ultrafine particles are those that are less than 100 nanometers in size. Approximately one thousand of these tiny particles can **fit across** a human hair. Each day, nearly everyone is exposed to at least some level of ultrafine particles. Outdoor sources of UFPs include vehicular and industrial **exhaust**, but there are numerous sources of these particles indoors. Among **them** are cooking, toaster ovens, cigarette smoke, and candles. Office equipment such as glue and laser printers also produces UFPs. Many studies have found that indoor levels of UFPs can exceed outdoor levels, even in areas with severe outdoor pollution.



Their small size makes ultrafine particles more dangerous to our health than larger particles. The reason is that they are so small that they can pass through our lung **tissue** and enter our **bloodstream**. From there, the particles enter the blood cells, where they can travel to other parts of the body, including the brain. Studies have shown that just five minutes of exposure to UFPs can increase the heart rate, and one hour of exposure can impair heart function. Long-term exposure can disrupt the body's *anti-inflammatory systems. This can lead to serious health problems, including heart and lung disease, and, in extreme cases, death.

These incredibly tiny particles comprise 90 percent of the pollution particles in the air. Yet no **regulatory** standards for them currently exist. The rise of *nanotechnology has generated more interest in the regulation of ultrafine particles. Even so, there is still no consensus on how to deal with them. In the meantime, most scientists agree that minimizing your exposure to UFPs and using high-quality air **filtration** machines are important for decreasing your chances of suffering from health problems from them.

Words 339

*anti-inflammatory: preventing parts of the body from becoming red, swollen, and irritated
*nanotechnology: the science of using atoms and molecules to build extremely small machines



Reading Skill

Cause and effect is when one event causes something to happen. The cause explains why something happens, and the effect is what happens as a result.

Q Why do ultrafine particles pose a greater health risk than larger particles?

A They are _____small_____ enough to pass through our _____lung tissue_____ and enter our bloodstream.

Vocabulary in Context

A **Match the words or phrases in bold from the passage with their correct definitions.**

1. particle — a very small piece of something
2. legislation — a law or set of laws set up by a government
3. regulatory — related to official rules for a business, activity, etc.
4. exhaust — the mixture of gases that comes out of an engine
5. fit across — to go from one side of something to the other side
6. tissue — the material in a plant or animal that makes up its body
7. bloodstream — the flow of blood moving from the heart through the body
8. filtration — the process of removing something unwanted from the air, water, etc.

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word curtail in the first paragraph is closest in meaning to _____.
   a. indicate ✓b. reduce c. sustain d. prolong

2. The word exceed in the second paragraph is closest in meaning to _____.
   ✓a. surpass b. succeed c. overcome d. enact

3. The word impair in the third paragraph is closest in meaning to _____.
   a. boost b. renovate c. improve ✓d. harm

4. The word consensus in the fourth paragraph is closest in meaning to _____.
   a. approval b. statistic ✓c. agreement d. opposition

C **Choose the best word to complete each sentence.**

1. The new government is enacting stricter laws to reduce industrial exhaust / exhaustion.
2. As his hearing was impaired / repaired, Michael used a hearing aid to listen to the teacher in class.
3. The board members were in consensus / disagreement as to how to solve the problem and had to come up with another solution.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the best ways to reduce your exposure to indoor ultrafine particles
✓b. a type of air pollution that is dangerous but difficult to regulate
c. new laws that will help solve the problems caused by ultrafine particles
d. how two types of dust particles combine to cause serious health problems

Details

2 **Which of the following is NOT true about ultrafine particles according to the passage?**

a. They are produced by cooking food or printing.
b. One thousand of them can fit across a human hair.
c. They are more common in areas where lots of people live.
✓d. They are predominately generated by outdoor sources.

3 **What does the word them in the second paragraph refer to?**

a. vehicular and industrial exhaust b. outdoor sources ✓c. indoor sources d. UFPs

4 **How does long-term exposure to ultrafine particles affect our bodies?**

It can disrupt our anti-inflammatory systems, leading to heart and lung disease.

5 **Which of the following is true according to the passage?**

a. Most legislation about fine particles also covers ultrafine particles.
✓b. Ultrafine particles make up the majority of air pollution particles.
c. Extended exposure to ultrafine particles makes your heart beat slower.
d. Ultrafine particles first enter the bloodstream, and then they enter the lungs.

6 **What are the two ways that scientists agree on to prevent health problems from UFPs?**

Minimizing exposure to UFPs and using air filtration machines

Inference

7 **What CANNOT be inferred from the passage?**

a. It is impossible for someone to have no exposure to ultrafine particles.
b. There is no agreement among lawmakers on how to deal with air pollution issues.
✓c. Scientists are using nanotechnology to help reduce levels of ultrafine particles.
d. People living in densely populated areas are more likely to have health problems because of UFPs.

Summary

A **Fill in the chart with the phrases in the box.**

Ultrafine Particles (UFPs)	
Description of UFPs	• Ultrafine particles are less than 100 nanometers in size. • They come from exhaust as well as ❶ indoor sources such as cooking, candles, and glue.
Problems of UFPs	• They are small enough to ❷ pass through our lungs and enter our bloodstream. • Exposure leads to problems ❸ with the heart and can disrupt the body's anti-inflammatory systems.
❹ Solutions for UFPs	• There is still ❺ no consensus on how to deal with UFPs. • Scientists agree that ❻ minimizing your exposure and using air filters are the best ways to reduce health problems.

no consensus　　indoor sources　　pass through our lungs
solutions for UFPs　　with the heart　　minimizing your exposure

B **Complete the summary with correct words by referring to the chart above.**

The ❶ smallest and most dangerous type of air pollution is ultrafine particles. Despite the dangers they pose, there has been little work done to solve the problems they cause. UFPs are less than 100 nanometers in ❷ size, and people are ❸ exposed to them every day. These particles are produced by ❹ exhaust but can also be found in our homes. Cooking, candles, and laser printers are just some ❺ sources of ultrafine particles. Because they are so small, UFPs can go through our ❻ lung tissue and enter our bloodstream. This can ❼ disrupt the body's anti-inflammatory systems, causing serious health problems. Although UFPs comprise 90 percent of ❽ air pollution particles, there is still no consensus on how to regulate them.

Unit 10

Theme | *History*
Reading Skill | *Categorizing*

The Making of the Great Pyramid

Before You Read



A **Think about the Topic**

1. What do you think the original purpose of the pyramids in Egypt was?
2. How do you think the pyramids were constructed?

B **Background Knowledge**

The pyramids of ancient Egypt are considered to be among the most famous wonders of the ancient world. Over 100 of these huge three-dimensional triangle structures still stand along the Nile River south of Cairo, the national capital. Most of them were constructed as tombs for Egypt's pharaohs and royal families during the Old and Middle Kingdoms. The oldest pyramid is the Pyramid of Djoser while the largest is the Great Pyramid of Giza. Today, millions of people from all over the world travel to Egypt to see these magnificent structures.



The Making of the Great Pyramid

▶ *As you read, pay attention to the two theories about the construction of the Great Pyramid of Egypt.* 10

Pyramids are not limited only to the Egyptians as many cultures have constructed pyramid-shaped buildings at various points throughout history. However, the Egyptian pyramids are **unsurpassed** in their size and fame. In 450 B.C., Herodotus, the Greek inventor of the field of history, was the first to describe the pyramids in Cairo. Of these, the Great Pyramid built for the Pharaoh Khufu in 2560 B.C. stands out; it is huge, being nearly 150 meters high and 230 meters wide on each side. Herodotus said that it took over 100,000 men more than 20 years to complete it. His claim that the Egyptians used giant machines to lift the stones into place has now been **dismissed**. Yet to this day, **archaeologists** still do not know how the ancient Egyptians were able to build such a huge structure.



The most popular theory is that the pharaoh forced the people to work during the rainy season. In Egypt, the Nile River floods annually, making farming impossible. Through the use of **sheer** manpower, men would have dragged **limestone** blocks from nearby *quarries to the site. By placing the blocks on **logs**, it would have taken about ten days to move each one. Workers at the construction site could then have used *ramps to pull the two-ton stones up to the desired height. There is some evidence for this theory, but some scientists argue that the ancient Egyptians did not have the technology to **carve** such gigantic stones or to move them.

A new theory is that the upper part of the Great Pyramid was built with a kind of concrete. The quarries from which the limestone was mined also contain kaolinite, which is a white mineral that turns into a clay-like substance when mixed with water and other minerals. Researchers believe that it would have been much easier for the Egyptians to transport **it**, other minerals, and water to the construction site and to mix them all there. The clay could be easily shaped into bricks and, once dry, would **harden** into stone. Some recent tests of the blocks at the Great Pyramid confirm that it is possible that they were made with kaolinite. If further tests prove this theory to be true, then perhaps ancient Egyptian society was much different than previously thought. Words 380

*quarry: a place where a lot of stone is dug out of the ground
*ramp: an angled surface that joins a low piece of land to a higher one

Reading Skill

Categorizing information means to arrange information or items into different groups.

Q What are the two main theories regarding the construction of the Great Pyramid?

A The most popular theory is that it was built using ___sheer manpower___ to move large stone blocks up ramps while the new theory says part of it was built using a clay-like substance called ___kaolinite___.

Vocabulary in Context

A **Match the words in bold from the passage with their correct definitions.**

1. harden — to become firm and strong
2. dismiss — to no longer consider something to be true
3. limestone — a light gray rock used as a building material
4. unsurpassed — better than anything else; excellent; incomparable
5. archaeologist — someone who studies objects or people from the past
6. sheer — used to emphasize the size or degree of something
7. log — a long, heavy piece of wood made from a cut down tree
8. carve — to make something by cutting into it, especially wood or stone

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word construct in the first paragraph is closest in meaning to _____.
   a. vanish b. employ ✓c. make d. destroy

2. The word manpower in the second paragraph is closest in meaning to _____.
   ✓a. workforce b. calculation c. population d. structure

3. The word gigantic in the second paragraph is closest in meaning to _____.
   a. insignificant b. widespread c. expensive ✓d. enormous

4. The word transport in the third paragraph is closest in meaning to _____.
   a. produce b. maintain ✓c. carry d. transform

C **Choose the best word to complete each sentence.**

1. I had mailed the letter two months previously / precisely.
2. How much liquid do you think this bottle accommodates / contains?
3. The CCTV video confirmed / contradicted what he had suspected: Someone had tried to break into his apartment.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. ancient techniques for construction that are still in use
b. the treatment of the poor by the pharaoh in ancient Egypt
✓c. possible explanations for the building of an ancient structure
d. evidence for the use of concrete in the construction of the pyramid

Details

2 **According to the passage, what is unique about the Egyptian pyramids?**

a. Their construction methods are unknown.
✓b. They are extremely large and famous.
c. They used giant machines in their construction.
d. They are the only pyramids still in existence.

3 **What is a problem with the theory that men moved the stones on logs?**

Some scientists argue the ancient Egyptians lacked the technology to carve the stones or to move them.

4 **Which of the following is NOT true about the theory of using manpower to build the Great Pyramid?**

✓a. The theory does not have any evidence to support it.
b. The builders of the pyramid used ramps to drag the stones upward.
c. It took more than a week for people to transport the blocks to the construction site.
d. People had to work on the construction of the pyramid during the rainy season.

5 **What does the word it in the third paragraph refer to?**

✓a. kaolinite b. water c. clay d. limestone

6 **How would using kaolinite have made construction easier?**

The mineral would have been easily carried to the site and mixed there with other minerals and water.

Inference

7 **What can be inferred from the passage?**

a. The kaolinite theory has not been verified at all.
b. The Pharaoh Khufu was greatly respected by ordinary Egyptians.
✓c. Only part of the Great Pyramid was made using a clay-like substance.
d. Kaolinite was introduced to the Egyptians by people from other countries.

Summary

A **Fill in the chart with the phrases in the box.**

The Construction of the Great Pyramid	
The Great Pyramid in Egypt	• It is the best-known of the ancient Egyptian pyramids. • The construction methods ❶ remain unknown.
Manpower Used to Move Stones	• The pharaoh forced people to ❷ drag huge stone blocks to build the pyramid. • ❸ Nearby quarries could have been used to supply large blocks of stone. • Ramps could have made it easy to ❹ drag stones upward.
Kaolinite Theory	• ❺ Scientific evidence suggests that some of the blocks were made of kaolinite. • Kaolinite would have been ❻ much easier to transport than stones.

nearby quarries　　remain unknown　　drag stones upward
much easier　　scientific evidence　　drag huge stone blocks

B **Complete the summary with correct words by referring to the chart above.**

The pyramids of ancient Egypt are world famous, and the Great Pyramid is the ❶ best-known. Archaeologists are still unsure how the ancient Egyptians ❷ constructed the Great Pyramid. The most widely believed theory is that the pharaoh ❸ forced people to drag huge limestone blocks from ❹ quarries to build it. Using logs and ❺ ramps, the men would have pulled the stones up to the desired ❻ height. A newer theory is that the Egyptians used kaolinite to make blocks at the construction site. When mixed with other minerals and water, it forms a clay-like substance similar to ❼ concrete. This is more likely since ❽ transporting the kaolinite would have been much easier.

Unit 11

Theme | *Jobs*
Reading Skill | *Compare & Contrast*

Illicit Hackers vs. Ethical Hackers

Before You Read

A **Think about the Topic**

1. What are some reasons you think that people perform hacking?
2. How do you think ethical hackers differ from other hackers?

B **Background Knowledge**

Technology is present in almost every aspect of our lives. While this offers us amazing convenience, it does come at a cost. Now it is easier than ever for people to find our personal information, and this can create serious problems. This is of special concern due to hackers. These computer experts use their knowledge of computer programming to break into computer systems. Hackers can then steal our information or disrupt websites. However, hackers do not always commit crimes. In fact, many of them use their skills to improve Internet safety.



Illicit Hackers vs. Ethical Hackers

▶ *As you read, pay attention to how hackers and ethical hackers are similar and different.* 11

When people talk about hackers, they are usually referring to black hats. These are criminals who use their computer skills to steal personal information, break into private databases, and **wreak havoc** online. But not all hackers are criminals. The ones who are not are referred to as white hats, and they work to protect both security systems and people's privacy online.

Both types of hackers use the same techniques to break into computer systems and networks. They usually penetrate a program's security by cracking passwords, installing Trojan viruses, and causing denial-of-service (DoS) attacks. A DoS attack occurs when a hacker **floods** a network with useless traffic, overloading the system and causing it to crash. This prevents **legitimate** users from accessing the network.



Where black hat and white hat hackers differ is in their **ethics**. Black hats always engage in hacking for personal benefit or pleasure. They may try to expose vulnerabilities in a new program and explain these weaknesses to other hackers. Other times, they steal other people's personal information for their monetary value, such as by hacking into a bank or shopping website to get people's credit card information or personal identities. Black hats often sell this information on the black market or to criminal organizations. They might also violate computer security systems for **malicious** reasons. For instance, they may cause a website that they do not like to crash.

White hats are the opposite of black hats. They are often computer security experts hired by companies and government organizations to make their networks and software safer. These ethical hackers may **be** well **versed in** tactics used by hackers. They use their knowledge to perform "penetration testing." This means that they intentionally compromise computer systems of organizations, much as black hats would. But rather than stealing information or **vandalizing** systems, ethical hackers report to organizations or developers how they gained access and what information they found. With this knowledge, the organizations can discover **their** security **loopholes** and improve their defenses.



While many people associate hacking with crime, the act itself is not illegal when the hacker compromises the system with the owner's permission. The fact is that many hackers are working hard to make the Internet a safer place for everyone. Words 372

Reading Skill

Comparing and contrasting is a way to explain how two or more things are similar and different.

Q How do black hats and white hats use the information they find on a computer system?

A Black hats steal information for personal benefit or vandalize the systems for pleasure while white hats help an organization discover its security loopholes.

Vocabulary in Context

A Match the words or phrases in bold from the passage with their correct definitions.

1. wreak havoc — to cause a lot of damage or destruction
2. legitimate — reasonable, accepted, or proper; allowed by law
3. malicious — having or showing a desire to harm or upset others
4. ethic — a system of moral belief that controls one's behavior
5. be versed in — to understand or know a lot about something based on experience
6. vandalize — to damage or destroy something, especially public property, on purpose
7. flood — to cause something to take in or receive a large amount of something at once
8. loophole — an error in the way a law, system, etc. is made so that people can legally avoid following it

B Look at the underlined words or phrases in the passage and choose the correct answers.

1. The word penetrate in the second paragraph is closest in meaning to _____.
   a. destroy ✓b. invade c. compose d. depart

2. The phrase engage in in the third paragraph is closest in meaning to _____.
   a. take place b. concentrate on ✓c. take part in d. point out

3. The word vulnerability in the third paragraph is closest in meaning to _____.
   a. identity b. sensitivity c. responsibility ✓d. susceptibility

4. The word violate in the third paragraph is closest in meaning to _____.
   ✓a. break into b. disobey c. pursue d. regulate

C Choose the best word to complete each sentence.

1. The yoga instructor taught us several different techniques / tactics to relieve stress.
2. I volunteer not for momentary / monetary benefit but to help out in the community.
3. If you are caught doing legitimate / illegal activities, you may be sent to prison.

Reading Comprehension

Main Idea

1 What is the passage mainly about?

a. the dangers of putting your personal information on websites
b. common techniques that hackers use to penetrate computer systems
✓c. how some hackers benefit personally while others make the Internet safer
d. advantages for companies to hire white hat hackers to test their computer networks

Details

2 According to the passage, what is one consequence of DoS attacks?

a. They expose the weaknesses of new programs.
b. They provide a monetary benefit to the hacker.
✓c. They prevent normal visitors from using websites.
d. They can install viruses on computer systems and networks.

3 What do black hats do with people's credit card information or personal information?

They sell the information on the black market or to criminal organizations.

4 What does the word their in the fourth paragraph refer to?

✓a. organizations b. ethical hackers c. systems d. black hats

5 How do white hats help organizations improve their defenses?

By reporting how they gained access to their computer systems and what information they found, the organizations can improve their security.

6 According to the passage, which of the following is NOT true about black hats?

a. They sometimes sell the information they find to criminals.
✓b. They perform security checks on websites that they do not like.
c. They will share the weaknesses of new programs with each other.
d. They break into computer systems without the permission of organizations.

Inference

7 What can be inferred from the passage?

✓a. The legality of hacking depends on its purpose.
b. White hats are more widely known than black hats are.
c. Most black hat hackers eventually become white hat hackers.
d. Companies don't usually hire white hats when their systems have been hacked.

Summary

A **Fill in the chart with the phrases in the box.**

Black Hats vs. White Hats	
Hacking Techniques	• Common hacking techniques include ❶ cracking passwords and installing Trojan viruses. • Denial-of-service attacks ❷ overload systems and cause them to crash.
Black Hats	• They engage in hacking for their ❸ personal benefit. • They expose the vulnerabilities of programs, steal other people's information, and violate systems for ❹ malicious reasons.
White Hats	• They ❺ intentionally compromise computer systems for companies and governments. • Exposing the weaknesses of systems allows organizations to ❻ close their loopholes and improve their defenses.

malicious reasons　　personal benefit　　close their loopholes
cracking passwords　　overload systems　　intentionally compromise

B **Complete the summary with correct words by referring to the chart above.**

Hackers use their skills to ❶ break into computer systems to steal information and to wreak ❷ havoc online. They penetrate a program's security by cracking passwords, ❸ installing Trojan viruses, and causing DoS attacks. But not all hackers are the same. One group, black hats, ❹ engage in hacking for their personal benefit. They take advantage of the ❺ vulnerabilities of programs, steal banking information, and violate computer systems for malicious reasons. White hats, on the other hand, work for companies and government organizations to ❻ intentionally compromise computer systems. By discovering the ❼ weaknesses of a system, white hats help these organizations close loopholes and ❽ improve their security.

Unit 12

Theme | *Natural Science*
Reading Skill | *Categorizing*

The Science Behind Clouds

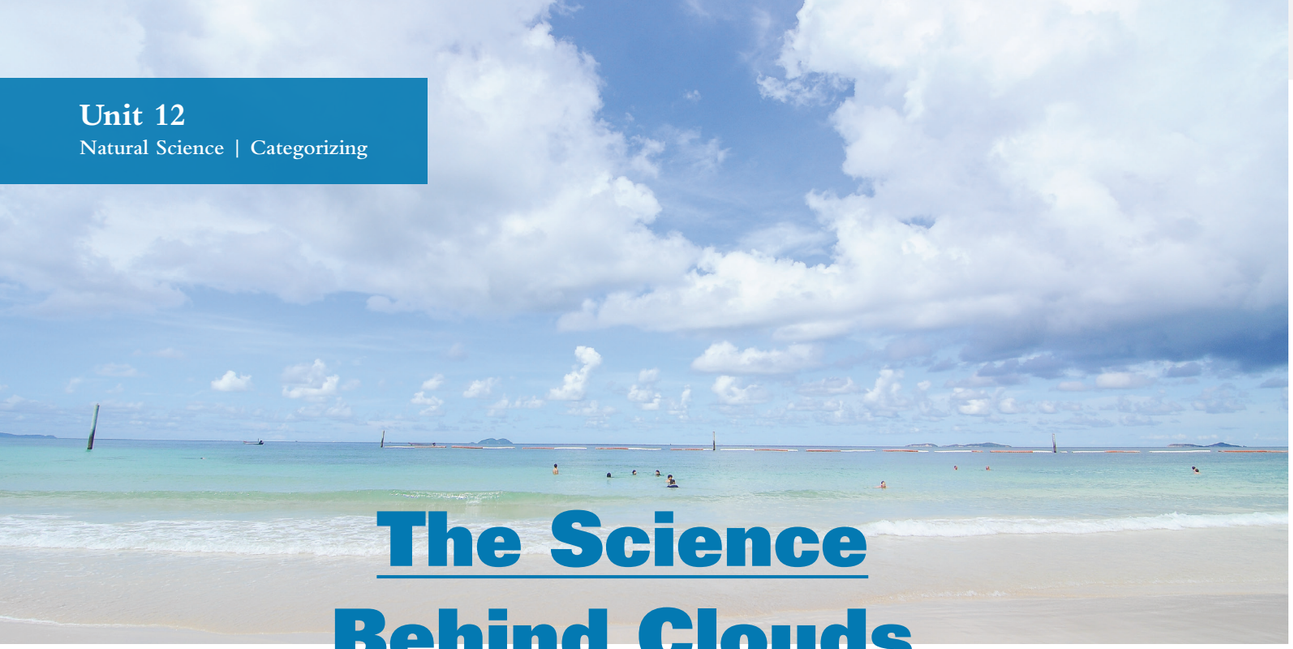
Before You Read

A **Think about the Topic**

1. How do you think clouds are formed?
2. Where do clouds get their white color from?

B **Background Knowledge**

The clouds in our skies are some of the most important parts of our planet's ecosystem. At any time, clouds cover approximately 70 percent of the Earth's surface. Having thick layers of clouds in various areas plays an important role in keeping the surface cool. Although clouds may look like solid balls of cotton, they are actually made of water in the air. Understanding how clouds are formed along with the different types of clouds will give you a better appreciation of our living planet.



Unit 12
Natural Science | Categorizing

The Science Behind Clouds

▶ *As you read, think about how clouds are formed and what creates their color.* 12

When we look at clouds in the sky, we rarely stop to wonder what these white cotton ball masses are made of. Clouds are simply large collections of tiny water **droplets** or ice crystals small enough to be **suspended** in the air. They are created from the water that **evaporates** from lakes, rivers, and oceans across the world.

Each cloud looks unique, but they all form in the same way: through the **condensation** of water. There is always water in the air, but it is not in liquid form. Closer to ground level, it is an invisible gas called water vapor. When air rises from ground level, it expands and cools. Cooler air cannot hold as much water vapor as the warmer air near the ground. So **it** causes the water vapor to condense onto tiny dust particles in the air, forming tiny water droplets around each particle of dust. If billions of these droplets join together, they create a visible cloud.

On sunny days, clouds generally appear white due to **refraction** caused by the reflective quality of the condensed water vapor. When the weather is sunny, all the **wavelengths** of the sun's light are reflected, creating a white appearance. On days when a thick layer of clouds goes across the entire sky, most sunlight is blocked by the cloud cover. Since much of the light does not make it through the clouds, the clouds have a darker, gray appearance. Having more layers of clouds can make them appear even darker.

There are 10 main types of clouds classified into three main categories. The first category is high clouds, referred to as cirrus clouds, which reach heights of 6,000 meters or more. They have a thin, narrow appearance and, because of their great **elevation**, are composed of ice crystals. They do not produce rain and are indicative of good weather. Next come mid-level alto-clouds that form between 2,000 meters and cirrus level. Two common types are altostratus clouds, which are flat, and altocumulus clouds, which are puffy. They show that bad weather such as a storm is approaching. Below 2,000 meters are low clouds, also called stratus clouds. These clouds can be dense, dark storm clouds, such as cumulonimbus clouds, or puffy white clouds **interspersed** with blue sky. Words 378



▲ Cirrus clouds



▲ Altocumulus clouds



▲ Cumulonimbus clouds

Reading Skill

Categorizing information means to arrange information or items into different groups.

Q What are the three main categories of clouds?

A They are _____cirrus_____ clouds at above 6,000 meters, _____alto-clouds_____ between 2,000 and 6,000 meters, and _____stratus_____ clouds below 2,000 meters.

Vocabulary in Context

A **Match the words in bold from the passage with their correct definitions.**

1. elevation — the height of a place
2. droplet — a small amount of liquid
3. evaporate — to change from a liquid to a gas
4. condensation — the process of a gas cooling and becoming a liquid
5. suspend — to stop something from falling due to some kind of support
6. intersperse — to put something in various places among something else; to scatter
7. wavelength — the distance from one point of energy to the next point as it travels
8. refraction — the process of making light change direction by going through water, air, etc. at an angle

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word expand in the second paragraph is closest in meaning to _____.
   a. condense ✓b. enlarge c. intensify d. enhance

2. The word join in the second paragraph is closest in meaning to _____.
   ✓a. connect b. enter c. reach d. carry

3. The word classify in the fourth paragraph is closest in meaning to _____.
   a. attach b. outline ✓c. arrange d. describe

4. The word dense in the fourth paragraph is closest in meaning to _____.
   ✓a. packed tightly b. simple c. loose d. intense

C **Choose the best word to complete each sentence.**

1. You can see the refractions / reflections of the buildings in the pond.
2. The police are going to extend / expand their investigation into nearby cities.
3. Our job is to turn this huge collection / condensation of data into smaller, easily understood units.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the main differences between types of clouds
b. the three main types of clouds and the kinds of weather they cause
c. how weather events in the atmosphere are affected by the sun's light
✓d. the formation, appearance, and categorization of a natural phenomenon

Details

2 **Which of the following is NOT true according to paragraph 2?**

a. Air carries water vapor all the time.
b. Water vapor is not visible at ground level.
✓c. Warmer air causes water vapor to form visible clouds.
d. Clouds are formed by the compression of water drops around dust.

3 **What does the word it in the second paragraph refer to?**

a. warmer air b. a dust particle c. the ground ✓d. cooler air

4 **Why do clouds have a white appearance on sunny days?**

They appear white because the water vapor in the clouds reflects all the wavelengths of the sun's light.

5 **Why do clouds sometimes have a darker appearance?**

They appear darker when a layer of cloud cover blocks sunlight from passing through.

6 **Which of the following is NOT true according to paragraph 4?**

a. Alto-clouds are a sign that a storm is approaching.
b. Low-level clouds cause more than one type of weather event.
c. Cirrus clouds suggest that the weather conditions will be favorable.
✓d. Clouds that are formed below 2,000 meters are comprised of ice crystals.

Inference

7 **What can be inferred from the passage?**

a. Clouds formed by ice crystals usually produce rain.
b. The color of clouds is affected by ground temperature.
c. Puffy white clouds are rarely seen in the sky on nice days.
✓d. Areas with greater levels of moisture are more likely to have clouds.

Summary

A **Fill in the chart with the phrases in the box.**

The Science Behind Clouds	
The Formation of Clouds	• Water vapor ❶ condenses onto tiny dust particles as air rises and cools. • A cloud is formed when ❷ billions of these particles join together.
The Coloration of Clouds	• Clouds appear white because the water vapor in them reflects ❸ all the wavelengths of light. • Thicker clouds appear gray because not all the sun's light ❹ passes through them.
The Categories of Clouds	• ❺ Cirrus clouds form at above 6,000 meters. • Mid-level alto-clouds form between 2,000 and 6,000 meters. • Stratus clouds are at ❻ the lowest level, forming below 2,000 meters.

passes through　　the lowest level　　condenses onto
all the wavelengths　　cirrus clouds　　billions of these particles

B **Complete the summary with correct words by referring to the chart above.**

All clouds are collections of evaporated water ❶ droplets. As air rises above the ground, it cools and causes the water vapor in it to condense onto tiny particles of ❷ dust in the air. When billions of these particles join together, a cloud is ❸ formed. Clouds get their ❹ white color from the water vapor in them reflecting all ❺ wavelengths of light. On days when the cloud cover is ❻ thicker, the light does not pass through the clouds. This causes them to have a darker appearance. There are 10 types of clouds ❼ classified into three categories. The first is cirrus clouds at elevations of 6,000 meters or more. ❽ Alto-clouds are mid-level, forming between 2,000 and 6,000 meters. At the lowest level are stratus clouds below 2,000 meters.

Unit 13

Theme | *Technology*
Reading Skill | *Main Idea*

Technology on Modern Weather Forecasting



Before You Read

A **Think about the Topic**

1. How do you think the weather is forecast?
2. Do you think it is possible to forecast the weather accurately?

B **Background Knowledge**

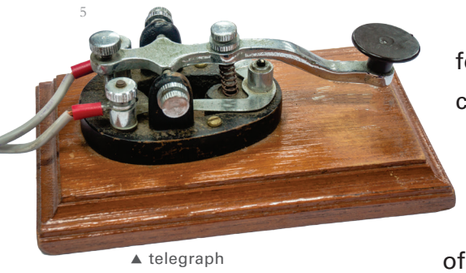
Weather forecasting began with early civilizations throughout the world. In 650 B.C., Babylonians looked at cloud patterns to predict the weather. Ancient Greek philosopher Aristotle wrote a series of books that explained how rain, clouds, winds, thunder, and other types of weather formed. For nearly two thousand years, Aristotle's books provided the basis for weather forecasting. By the end of the Renaissance, people realized that tools were necessary to accurately measure the weather. The inventions of the hygrometer, thermometer, and barometer all made it possible to record the weather.



Technology on Modern Weather Forecasting

▶ *While you read, consider the relationship between technology and the interpretation of data in weather forecasting.* 13

In the past, to predict the weather, people relied upon weather **lore**. This was an informal body of knowledge that was based on long-term observations of weather patterns. The method was not very accurate. However, observations still form the basis of modern weather forecasting.


▲ telegraph

Technology eventually became a part of weather-forecasting efforts. The modern science of meteorology can be traced back to the invention of the *telegraph. This technology allowed distant stations to quickly exchange local observations. In time, **this gave way to** the use of **synoptic** maps. These images showed the patterns of wind, pressure, temperature, and rain or snow for a large area of land. Later, large balloons with special equipment were sent **aloft** to collect more information. However, weather forecasting still required people to interpret the data. And predictions were simply **educated guesses** that were still subject to human error.

The **launch** of the first weather satellite was a major advance. It enabled meteorologists to gather information about conditions over the oceans. In addition, computers have had a great impact on the field of weather modeling. Computer models are much like the synoptic maps of the past. For example, they use data to create a **simulated** image of current conditions, so there is much less room for human error in the process.

However, gathering information about current weather conditions is only somewhat useful. This is why scientists have done a lot of research into understanding how to convert information about weather conditions into **equations**. Numerical weather prediction uses these equations to create predictions of the weather. Short- and mid-term weather forecasts have become considerably more accurate thanks to numerical weather predictions. Even so, it is still difficult to make long-range weather forecasts due to the unpredictable nature of the atmosphere.

Despite the increased role of technology in meteorology, human forecasters still play major roles. For one, they must accurately measure current weather conditions to produce reliable weather forecasts. They must also correctly interpret the information that computer simulations produce. In addition, forecasters must present the information so that it can be easily understood by the public. Words 349



*telegraph: a method of sending and receiving messages by electric or radio signals

Reading Skill

*The **main idea** is usually at the beginning of a text and makes a general statement.*

Q What is the main idea of the passage?

A Although _____technology_____ plays a greater role in weather forecasting these days, it is still necessary for _____humans_____ to interpret the data accurately.

Vocabulary in Context

A Match the words or phrases in bold from the passage with their correct definitions.

1. aloft — in the air
2. simulated — made to look like something; not real
3. give way to — to be replaced by something more advanced
4. educated guess — a guess based on some knowledge or information
5. launch — the act of shooting something into the air or space
6. lore — traditional knowledge and stories about a particular subject
7. equation — a mathematical statement showing two expressions are equal
8. synoptic — displaying data on weather conditions over a wide area at a given time

B Look at the underlined words or phrases in the passage and choose the correct answers.

1. The word basis in the first paragraph is closest in meaning to _____.
   a. reason ✓b. foundation c. attempt d. inspiration

2. The phrase trace back to in the second paragraph is closest in meaning to _____.
   a. join together b. sketch in c. take place ✓d. connect to

3. The word room in the third paragraph is closest in meaning to _____.
   a. circumstance b. location ✓c. possibility d. miscalculation

4. The word convert in the fourth paragraph is closest in meaning to _____.
   a. discourage ✓b. transform c. generate d. invade

C Choose the best word to complete each sentence.

1. Could we convert / convey the small bedroom into a second bathroom?
2. The anti-smoking campaign has had quite a(n) consequence / impact on young people.
3. A good car needs to be reliable / responsible so you never have to worry about it breaking down.

Reading Comprehension

Main Idea

1 What is the passage mainly about?

a. human error in forecasting the weather
b. the impact of the telegraph on modern meteorology
✓c. the science and history behind modern meteorology
d. the reliance upon visual observation in early weather modeling

Details

2 What invention started modern weather forecasting?

The telegraph allowed people to exchange weather observations.

3 What does the word this in the second paragraph refer to?

a. weather forecasting ✓b. the telegraph
c. the science of meteorology d. a distant station

4 Which of the following is true according to the passage?

a. Current weather forecasting still depends on weather lore.
b. Synoptic maps made it possible to share local weather information quickly.
✓c. Satellites enabled scientists to gather weather data over large bodies of water.
d. Numerical weather prediction has made long-term forecasts highly accurate.

5 Why did weather balloons not prove to be completely accurate indicators of the weather?

People had to interpret the data by making predictions that were educated guesses.

6 How do computer models make it easier to predict the weather?

✓a. They reduce the likelihood that humans misinterpret the data.
b. They make it possible to gather data on weather conditions in the sky.
c. They allow people to learn about the weather conditions in nearby areas.
d. They enable forecasters to collect more data on current weather conditions.

Inference

7 What can be inferred about paragraph 5?

a. The public must understand everything about weather forecasting.
b. Meteorologists can usually only make educated guesses about the weather.
c. Human forecasters are no longer necessary to make accurate weather predictions.
✓d. Forecasters have the added burden of making information widely understood.

Summary

A **Fill in the chart with the phrases in the box.**

Technology of Weather Forecasting	
Early Meteorology	❶ Observations of the weather formed the basis of weather forecasting in the past.
Forecasting and Technology	• Technology including the telegraph, synoptic maps, and balloons allowed people to gather more data about the weather, but the data still required ❷ human interpretation. • ❸ Weather satellites and computer models allow scientists to gather more data about current weather conditions while reducing ❹ human error.
Continued Research	Research has been done to ❺ convert weather information into equations that can accurately predict short- and mid-term weather conditions.
The Human Element	Forecasters still play an ❻ important role in measuring, interpreting, and explaining weather data.

human error　observations of the weather　human interpretation
important role　weather satellites　convert weather information

B **Complete the summary with correct words by referring to the chart above.**

Weather prediction has a long history and humble origins. The first forecasts were based merely on long-term weather ❶ observations. Technology such as the telegraph made it possible to share weather ❷ conditions with people in other areas. ❸ Synoptic maps and weather balloons allowed us to ❹ gather more information about the weather, but these forms of technology to gather data still relied on human ❺ interpretation. More sophisticated technologies such as computer models reduced human error, and researchers have worked to create ❻ equations to predict the weather more ❼ accurately. In spite of modern weather technology, ❽ forecasters are still needed to measure and interpret information and to make weather forecasts.

Unit 14

Theme | *Health*
Reading Skill | *Compare & Contrast*

The Fats That We Eat

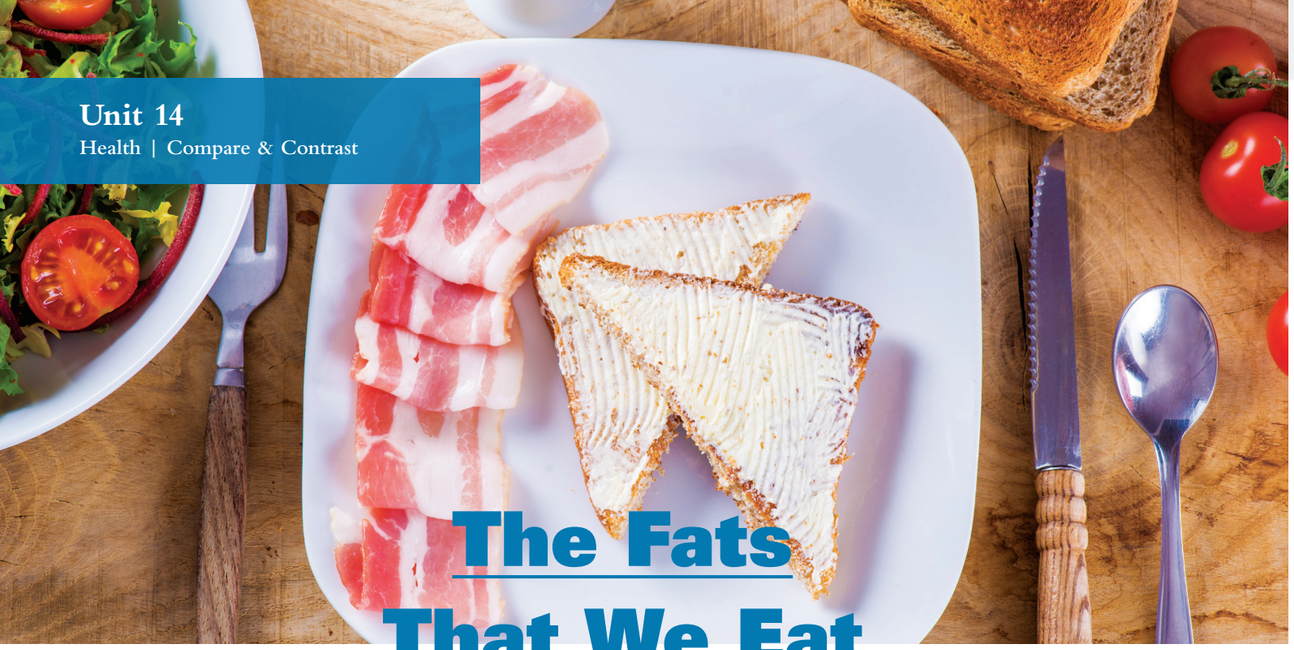
Before You Read

A **Think about the Topic**

1. What are some of the most important nutrients we get from food?
2. How do you think our body uses the fat we get from foods?

B **Background Knowledge**

The foods we eat have many different nutrients and minerals in them. While vitamin A, calcium, and other such components of food are almost always beneficial for our health, this is not always the case with fat. It is true that our bodies need fat to function, but not all types of fats in food are the same. Some kinds of fat can cause health problems whereas other types of fat can help us become healthier. This is why it is important to learn about the different types of fat so that we can make smarter eating decisions and enjoy a higher quality of life.



Unit 14
Health | Compare & Contrast

The Fats That We Eat

▶ *As you read, try to understand the differences between the three types of fats.*

14

Our bodies need **dietary** fat as a source of energy and to help with the absorption of **nutrients**. Fat is also necessary for growth and development, as well as maintaining good health. However, there is more than one type of fat, and not all of them are healthy. Which types of fats should you be including in your diet?

The first type of fat is **saturated** fat, so named because it is saturated with hydrogen molecules. This complete saturation makes saturated fat chemically stable and solid at room temperature. Saturated fat is naturally occurring in animal products such as red meat, **poultry**, and dairy products. Certain animal products, such as chicken breasts, are leaner, meaning that they contain less saturated fat. Health experts generally advise against consuming too much saturated fat as it is linked to high cholesterol levels and an increased risk of **cardiovascular** disease.

Another naturally occurring form of fat is unsaturated fat. Compared with saturated fat, unsaturated fat has fewer hydrogen molecules. The most obvious consequence of this is that this form of fat is liquid at room temperature, and because of this, it is referred to as oil. Typical sources of unsaturated fat include plant sources such as olives, nuts, and seeds, as well as fish such as tuna. Unlike saturated fat, unsaturated fat is healthy. It can reduce levels of bad cholesterol in the blood as well as lower the risk of heart disease. Make sure to incorporate as many sources of unsaturated fat as possible into your diet.



Most experts agree that trans fat is the worst for your body and that you should eat as little of it as possible. Trans fat can naturally occur in the **guts** of some animals, but most trans fat is created artificially. Food manufacturers add hydrogen to unsaturated oils to make them solid, and the fat is then used to make foods such as stick margarine, coffee creamer, fried foods, and some baked goods like cakes. They do this to improve the **texture**, **shelf life**, and flavor of their foods. Nevertheless, the U.S. Food and Drug Administration (FDA) declared in 2015 that companies will be mandated to remove all trans fat from their products. This could prevent up to 20,000 heart attacks and 7,000 deaths in the United States each year.

Words 384



Reading Skill

Comparing and contrasting is a way to explain how two or more things are similar and different.

Q What are the health effects of saturated and unsaturated fats?

A Saturated fat can lead to heart problems because it increases levels of bad ___cholesterol___ while unsaturated fat lowers heart disease risks as it ___reduces___ bad cholesterol levels.

Vocabulary in Context

A **Match the words or phrases in bold from the passage with their correct definitions.**

1. guts — the internal organs of an animal
2. dietary — relating to the foods someone eats
3. saturated — completely filled with a substance
4. cardiovascular — relating to the heart and blood system
5. nutrient — a substance that living creatures need to grow
6. texture — the feeling created by a food or drink in your mouth
7. poultry — meat that comes from chickens, ducks, and geese
8. shelf life — the length of time that a product stays fresh and can be sold

B **Look at the underlined words or phrases in the passage and choose the correct answers.**

1. The word absorption in the first paragraph is closest in meaning to _____.
   a. concentration ✓b. intake c. contradiction d. enhancement

2. The phrase linked to in the second paragraph is closest in meaning to _____.
   a. caused by b. coupled with ✓c. related to d. concerned about

3. The word obvious in the third paragraph is closest in meaning to _____.
   a. ordinary b. cautious c. debated ✓d. evident

4. The word mandate in the fourth paragraph is closest in meaning to _____.
   a. suggest b. replace ✓c. instruct d. punish

C **Choose the best word to complete each sentence.**

1. It is easier to grow crops in an area with a stable / staple climate.
2. I enjoy the smooth texture / structure of my mother's chocolate pudding.
3. Although dried fruits may seem to be good for your nutrients / diet, they have a lot of added sugar.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. which types of nutrients are most important for our bodies
✓b. a comparison of the different types of fats found in foods
c. the reasons that trans fat is being banned from food products
d. how it is possible to turn saturated fat into unsaturated fat

Details

2 **Which of the following is NOT true according to the passage?**

a. Unsaturated fat is found in plant sources such as nuts as well as in fish.
b. Unsaturated fat can reduce the chances of problems related to the heart.
✓c. Chicken breasts and some other products do not contain any saturated fat.
d. Saturated fat is solid because it contains a high amount of hydrogen molecules.

3 **What is the result of unsaturated fat having fewer hydrogen molecules?**

It is liquid at room temperature.

4 **What does the word They in the fourth paragraph refer to?**

a. animals ✓b. food manufacturers c. baked goods d. unsaturated oils

5 **How is trans fat produced by food companies?**

It is produced by adding hydrogen to unsaturated oils to make them solid.

6 **In paragraph 4, the author states that trans fat _____.**

a. causes foods to spoil more quickly
b. has only been created by scientists
c. is less harmful for the heart than saturated fat
✓d. makes foods have a better feeling in the mouth

Inference

7 **What can be inferred from the passage?**

a. People should avoid eating fats because of their harmful effects.
b. Fats containing many hydrogen molecules are good for our health.
✓c. People who eat more nuts and vegetables are less likely to have heart problems.
d. The regular consumption of foods with saturated fat will help people lose weight.

Summary

A **Fill in the chart with the phrases in the box.**

The Fats That We Eat	
Saturated Fat	• Saturated fat is a type of ❶ solid fat that is naturally occurring in ❷ animal products such as red meat. • It can create health problems for the ❸ cardiovascular system because of its high levels of cholesterol.
Unsaturated Fat	• Unsaturated fat is found in plants, nuts, and fish. • It contains ❹ less hydrogen and can reduce bad cholesterol.
Trans Fat	• Trans fat is the most dangerous type of fat, is usually ❺ produced artificially, and is used to make margarine, fried foods, and baked goods. • The FDA has ❻ banned the use of trans fat because it is so unhealthy.

less hydrogen　　solid fat　　produced artificially
animal products　　banned the use　　cardiovascular system

B **Complete the summary with correct words by referring to the chart above.**

Our bodies need fat to create energy and to ❶ absorb nutrients. But not all fats are the same, and it is important to know the differences between them. ❷ Saturated fat is the first type. This solid fat occurs ❸ naturally in meat products and dairy products, but most experts agree that it can cause health problems. Unsaturated fat, on the other hand, is found in plants, ❹ nuts, seeds, and fish, and is ❺ liquid at room temperature. Unsaturated fat is ❻ healthy as it lowers bad cholesterol. The most ❼ dangerous type of fat is trans fat, usually found in foods such as margarine, fried foods, and baked goods. Trans fat is so unhealthy that the FDA now requires companies to ❽ remove it from their products.

Unit 15

Theme | *Technology*
Reading Skill | *Cause & Effect*

Do We Have Enough Minerals to Survive?

Before You Read

A **Think about the Topic**

1. Do you think we will run out of the materials we need to build things?
2. Are you willing to pay more for goods made from recycled products?

B **Background Knowledge**

The Industrial Revolution in the 18th century completely changed the world. For the first time, companies could manufacture products millions at a time. This has made people's lives easier and more convenient, but such widespread manufacturing has also created an endless demand for minerals. These substances found in the earth have made it possible to create cars, computers, and much more. The problem is that these minerals are running out, and there may not be a suitable replacement to keep up with demand.



Do We Have Enough Minerals to Survive?

▶ *When you read, consider what the problem of using minerals is and how it can be solved.*

15



A mineral is an **inorganic** substance that develops by natural processes. Minerals are the building blocks of rocks, and rocks are made up of one or more minerals. While more than 3,000 different kinds of minerals exist, only about 30 of them are widely used. Minerals such as gold and silver, being much rarer, are considered much more valuable. People have been mining minerals since the beginning of history. However, in the 20th century, people used more minerals than in all the total years before it. While this has benefited many companies, it has worried a number of scientists. Since minerals are **finite** resources, their availability may soon become insufficient for our needs.

The tremendous rise in demand for minerals is primarily due to the industrialization of the Western world, a time known as the Industrial Revolution. At that time, minerals became necessary for the building of machines and for the goods they produced. The demand for minerals led to the rise of companies that could find and **extract** the minerals from underground **deposits**. At first, the rate of extraction was fairly low since mining was very expensive. However, advances in technology and cheaper transportation enabled minerals to be mined at a much greater rate.

Concerns about the **scarcity** of minerals are not **unanimous**. Some researchers argue that the market will push up the prices of rare minerals, causing the demand for them to decrease. In addition, increased prices also make it profitable to mine difficult-to-reach areas. For instance, many companies are starting to mine **offshore**. They build platforms on the ocean, and these huge structures drill deep into the ocean floor to extract minerals. Many scientists feel that these types of mining offer the possibility to increase the amount of minerals produced.

Recycling also offers a way to increase the availability of minerals. Metals such as iron and aluminum can be **reprocessed**. Those materials are considered to be infinitely recyclable. That means the minerals are not changed during the recycling process. As a result, there is a vast reservoir of minerals still available for use. Words 346



Reading Skill

Cause and effect is when one event causes something to happen. The cause explains why something happens, and the effect is what happens as a result.

Q What made it possible to extract minerals at a greater pace?

A The development of better ___technology___ and cheaper ___transportation___

Vocabulary in Context

A Match the words in bold from the passage with their correct definitions.

1. finite — having a limit or end
2. unanimous — agreed by all people
3. offshore — in the sea, not far from the coast
4. scarcity — the state of being in a shortage
5. inorganic — not being or consisting of living material
6. deposit — a layer of a substance that has formed under the ground
7. reprocess — to treat a material that has been used so it can be used again
8. extract — to remove or take out something by using a machine or chemicals

B Look at the underlined words in the passage and choose the correct answers.

1. The word availability in the first paragraph is closest in meaning to _____.
   a. security ✓b. accessibility c. ability d. reservation

2. The word tremendous in the second paragraph is closest in meaning to _____.
   ✓a. enormous b. controversial c. unexpected d. significant

3. The word primarily in the second paragraph is closest in meaning to _____.
   a. originally b. interestingly c. fundamentally ✓d. mostly

4. The word reservoir in the fourth paragraph is closest in meaning to _____.
   a. area ✓b. supply c. conservation d. opportunity

C Choose the best word to complete each sentence.

1. The museum is full of rare / scarce and precious treasures.
2. What sort of substance / resource could withstand those temperatures?
3. There is a sufficiency / scarcity of clean water in several developing countries.

Reading Comprehension

Main Idea

1 What is the passage mainly about?

a. the need to recycle iron and aluminum
✓b. concerns about the future availability of minerals
c. the most commonly used minerals in manufacturing
d. the increased use of technology in manufacturing

Details

2 According to the passage, the value of a mineral is related to _____.

✓a. how common it is
b. how much gold it contains
c. the area where it was found
d. the process used to extract it

3 Why did the demand for minerals increase according to the passage?

Due to the Industrial Revolution, minerals were needed for machines and products.

4 What does the word them in the third paragraph refer to?

a. concerns b. researchers c. prices ✓d. rare minerals

5 What is the main benefit of offshore mining according to scientists?

It offers the possibility to increase the amount of minerals produced.

6 How do metals now being used contribute to the total supply of minerals available?

✓a. They can be reused indefinitely.
b. They can be used to make other minerals.
c. They are most often used to build machinery.
d. They are cheaper than minerals mined offshore.

Inference

7 What CANNOT be inferred from the passage?

a. Offshore mining is more expensive than traditional mining.
b. Many industrial products require minerals to be produced.
✓c. It is possible to create artificial minerals in laboratories.
d. Not all researchers are concerned about the future supply of minerals.

Summary

A **Fill in the chart with the phrases in the box.**

Debate about the Availability of Minerals	
Mineral Scarcity	**No Mineral Scarcity**
• Industrialization significantly increased the ❶ demand for minerals to build machines and to make goods. • New technology and ❷ cheaper transportation have increased the rate minerals are mined.	• Increased prices for rare minerals will ❸ decrease demand. • New technologies such as ❹ offshore mining open new areas that ❺ contain resources. • Some metals can ❻ be reused over and over.

offshore mining　　decrease demand　　contain resources
be reused　　cheaper transportation　　demand for minerals

B **Complete the summary with correct words by referring to the chart above.**

Humans have mined ❶ minerals since the beginning of time, but since the Industrial ❷ Revolution, they have become a far more important resource. At that time, minerals became necessary for the building of ❸ machines and for the items they produced. Developments in ❹ technology made it easier to extract minerals quickly. However, not everyone believes this will lead to a mineral ❺ scarcity. ❻ Increased prices for rare minerals will ❼ reduce demand. In addition, methods such as offshore mining and ❽ recycling metals such as iron and aluminum will help to meet demand for minerals.

Unit 16

Theme | *Biology*
Reading Skill | *Compare & Contrast*

The Uses of Mimicry by Certain Animals

Before You Read

A **Think about the Topic**

1. Why are some animals born with specific colors or patterns?
2. In nature, what is the concept of adaptation?

B **Background Knowledge**

Predators most often hunt their prey by using their eyes, and for this reason, many species have developed special coloration to reduce their chances of being eaten. This use of coloration for protection is called camouflage. It is especially common in insects, lizards, snakes, frogs, and other small animals. Most of the time, these animals have body colors similar to leaves and other parts of their environment. Some insects even look like twigs or leaves. While the use of camouflage is important to help these vulnerable animals to survive, it is not the only method that animals have evolved to protect themselves.



Unit 16
Biology | Compare & Contrast

◂ hoverfly

The Uses of Mimicry by Certain Animals

▸ *While you read, focus on the differences between Batesian mimicry and Mullerian mimicry.* 16

Evolution favors those organisms which have **adaptations** that best suit the environment. One is the use of coloration. This enables a plant or animal to **blend in**. The more advanced version of this is **mimicry**. In this case, species mimic other creatures, usually in an attempt to deceive a predator. While it can appear in a number of different manners, scientists have classified two main types.

Batesian mimicry refers to a harmless species mimicking the appearance of a harmful or toxic species to make **it** unappealing to predators. Most of these mimics use the same bright colors or **markings** of the protected species—the harmful animal they copy—to ensure that they are not consumed. Typically, this is an adequate defense. Predators, through experience, have learned to avoid any creature that looks like the protected species. In this case, the Batesian mimic is not related to the protected, or model, species; it simply benefits from its resemblance.



honeybee ▸

It is important to note, though, that the Batesian mimic does not have any of the defenses possessed by the model species, such as toxins or stingers. For instance, the honeybee has a powerful stinger that injures any animal that consumes it. Birds and other insect-eating creatures purposefully avoid it. The hoverfly lacks the same defenses as the honeybee. Yet its yellow and black coloration resembles the bee, and it shares the same environment. As a result, it is rarely eaten.

In contrast, Mullerian mimicry involves two or more species living in close proximity that both have sufficient defense mechanisms and similar appearances. As both mimics can defend themselves, looking similar would not seem to be necessary. Yet there is a significant evolutionary advantage in doing so. Predators are not born with the knowledge of which species are poisonous. They only learn so through **trial and error**. This means that a certain number of individuals among each prey population are sacrificed to protect the entire group. However, if a certain **trait**, such as red coloration, clearly **announces** that the species is dangerous, then predators more easily know to avoid species with that trait. For example, the viceroy and monarch butterflies both have an unpleasant taste. Their similar orange and black coloration greatly reduces the chances of either being consumed by predators. Words 377



▲ Viceroy butterfly



▲ Monarch butterfly

Reading Skill

Comparing and contrasting is a way to explain how two or more things are similar and different.

Q How are Batesian mimicry and Mullerian mimicry different?

A Batesian mimics resemble a ___harmful species___ but do not have any physical defenses such as toxins while Mullerian mimics have ___similar___ appearances and ___defense___ mechanisms to warn predators that they are dangerous.

Vocabulary in Context

A **Match the words or phrases in bold from the passage with their correct definitions.**

1. trait — a characteristic
2. announce — to make known in a definite way
3. blend in — to look like other things around you
4. adaptation — the process of adjusting to the environment
5. marking — a pattern or group of colors on an animal's body
6. evolution — a gradual process of change and development
7. mimicry — the act of copying someone or something else
8. trial and error — the process of trying different ways to solve a problem until one is successful

B **Look at the underlined words in the passage and choose the correct answers.**

1. The word deceive in the first paragraph is closest in meaning to _____.
   a. betray ✓b. trick c. inform d. guide

2. The word adequate in the second paragraph is closest in meaning to _____.
   ✓a. sufficient b. impressive c. effective d. confusing

3. The word purposefully in the third paragraph is closest in meaning to _____.
   a. voluntarily b. optionally c. instinctively ✓d. intentionally

4. The word proximity in the fourth paragraph is closest in meaning to _____.
   a. remoteness ✓b. vicinity c. relationship d. distribution

C **Choose the best word to complete each sentence.**

1. He accumulates / consumes vast amounts of potato chips with every meal.
2. They are purely weapons for offense / defense and are not designed for attacking.
3. Although done unintentionally / purposefully, I made it seem like I had run into her by chance.

Reading Comprehension

Main Idea

1 **What is the passage mainly about?**

a. the characteristics exhibited by all animals that have no defenses
✓b. the way some animals have evolved to defend themselves in the wild
c. the subtle ways in which Mullerian mimics are superior to Batesian mimics
d. the ways in which a predator will react to its prey if it senses any danger

Details

2 **What does coloration indicate to some predators?**

✓a. the likelihood that their prey will be poisonous
b. whether or not their prey is a mimic and what kind it is
c. the chances of their prey having numerous defense methods
d. that most predators only consider patterns and not colors

3 **What does the word it in the second paragraph refer to?**

a. mimicry ✓b. a harmless species c. appearance d. a harmful species

4 **How does the hoverfly defend itself?**

It defends itself by having a similar appearance to the more dangerous honeybee.

5 **How do animals benefit from Mullerian mimicry?**

a. They do not need to have physical defenses against predators.
b. They share characteristics with all species that have the same coloration.
c. They develop coloration that is more appealing to other animal species.
✓d. They have to sacrifice fewer members to teach predators not to eat them.

6 **What do the viceroy and monarch butterflies have in common?**

They both have similar appearances and an unpleasant taste.

Inference

7 **What can be inferred from the passage?**

a. Most predators rely on other forms of mimicry.
b. Animals with Batesian mimicry are related to one another.
c. Batesian mimicry is more common than Mullerian mimicry.
✓d. Mimicry is the most beneficial when the two species live near each other.

Summary

A **Fill in the chart with the phrases in the box.**

The Uses of Mimicry	
❶ Animal Adaptation	Mimicry refers to creatures that have developed ❷ similar characteristics as other creatures in order to ❸ deceive predators.
Batesian Mimicry	The mimics lack ❹ defense mechanisms that the protected species have and must rely on having ❺ similar coloration to avoid being eaten.
Mullerian Mimicry	Mullerian mimicry refers to two or more species that have defense mechanisms and have evolved to ❻ look like each other.

look like　　similar characteristics　　animal adaptation
similar coloration　　deceive predators　　defense mechanisms

B **Complete the summary with correct words by referring to the chart above.**

Evolution and ❶ adaptation protect animals in different ways. One such adaption is mimicry. This is when animals ❷ mimic, or copy, the characteristics of other animals to ❸ trick(deceive) predators and to increase their chances of survival. In Batesian mimicry, one kind of animal copies the ❹ coloration or appearance of another more ❺ dangerous animal. As a result, predators avoid eating the mimic. Alternatively, Mullerian mimicry is carried out by species that have other ❻ defensive capabilities and have evolved similar ❼ appearances to further reduce the chances of being consumed by ❽ predators.