

IDENTITY

WARM UP

Discuss these questions with a partner.

1. In what ways do you look similar to your parents?
2. How are you different now from when you were younger?

Fraternal twins like Marcia (left) and Millie Biggs often look quite different from each other.

- Cyclists in Dubai race along the road. Research suggests that teenagers like to seek out new, sometimes **wild**, activities, due to natural **impulses** in the brain during **adolescence**.

BEFORE YOU READ

DEFINITIONS A. Look at the photo and read the caption. Match each word in **bold** with its definition.

1. **Wild** behavior •
 - a. is the time when children slowly become adults.
2. **Adolescence** •
 - b. is a sudden desire to do something.
3. An **impulse** •
 - c. refers to acting in an excited and uncontrollable way.

PREDICTING B. At what age do you think a person's brain finishes developing? Read the passage and check your ideas.



THE TEENAGE BRAIN

A Parents, teachers, and anyone who regularly **deals with** teenagers knows how difficult the adolescent years can be. Adolescents have always been known to do wild—even dangerous—things. This was thought to be due to the foolishness¹ of youth. Now, brain-imaging technology allows scientists to study the physical development of the brain in more detail than ever before. Their discoveries have led to a new theory of why teens act the way they do.

A Work in Progress

B Recently, scientists discovered that though our brains are almost at their full size by the age of six, they are far from fully developed. Only during adolescence do our brains truly “grow up.” During this time, they **go through** great changes, like a computer system being **upgraded**. This “upgrade” was once thought to be finished by about age 12. Now, scientists have **concluded** that our brains continue to change until age 25. Such changes make us better at balancing our impulses with the need to follow rules. However, a still-developing brain does this clumsily.² The result, scientists claim, is the unpredictable behavior seen in teenagers.

¹ **Foolishness** refers to the behavior of someone who makes bad decisions.

² If something is done **clumsily**, it is done in an awkward or uncontrolled way.

Pleasure Seekers

- C The studies confirm that teens are more likely to take **risks** and behave in extreme ways. Fortunately, the news isn't all negative. As brain scientist B. J. Casey points out, the teen brain inspires such behavior in order to help teenagers prepare for adult life.
- D One way the brain does this is by changing the way teens measure risk and **reward**. Researchers found that when teens think about rewards, their brains release more of the chemicals that create **pleasure** than an adult brain would. Researchers believe this makes the rewards seem more important than the risks, and makes teens feel the **excitement** of new experiences more keenly than adults do.
- E Research into the structure of the teen brain also found that it makes social connections seem especially rewarding. As such, teens have an **intense** need to meet new people. Scientists suggest this is because as teens, we begin to **realize** that our peers may one day control the world we live in. Because it is still developing, a teen brain can change to deal with new situations. It therefore connects social rewards with even more pleasure. In this way, the brain encourages teens to have a wide circle of friends, which is believed to make us more successful in life.
- F Unfortunately, this hunt for greater rewards can sometimes lead teens to make bad decisions. However, it also means that teens are more likely, and less afraid, to try new things or to be independent. The scientists' findings suggest that in the long run, the impulses of the teen brain are what help teens leave their parents' care and live their own lives successfully.



◀ Two teenagers hang out in a diner.

A. Choose the best answer for each question.

- PURPOSE** 1. What is the main purpose of the reading?
 a. to suggest that today's teenagers think differently from previous generations
 b. to explain how teenagers' brains affect their behavior
 c. to describe an experiment that looked at the brains of teenagers
- DETAIL** 2. Which of the following statements about an adolescent's brain is NOT true?
 a. It can change to deal with new situations.
 b. It is better than an adult brain at following rules.
 c. It is still developing.
- PARAPHRASING** 3. In paragraph C, what does the author mean by *the news isn't all negative*?
 a. The negative side of the research is not understood.
 b. The way the teen brain works has some advantages.
 c. The impulses of a teenage brain should be controlled.
- VOCABULARY** 4. In paragraph D, what does *keenly* mean?
 a. strongly
 b. loudly
 c. slowly
- MAIN IDEA** 5. Which of the following would be the best heading for the last paragraph?
 a. An Independent Brain
 b. The Rewards of Friendship
 c. The Parents' Role

SUMMARIZING B. Complete the sentences. Use one to three words from the passage for each answer.

1. Scientists are now better able to study the physical development of the brain thanks to improvements in _____ technology.
2. By the age of _____, a child's brain is almost at its full size.
3. Teenagers' brains go through an upgrade similar to that of a(n) _____.
4. Scientists now know that our brains continue to change until the age of _____.
5. Teenagers' brains measure risk and reward differently than _____ brains do.
6. Some believe that having a _____ of friends makes us more successful in life.
7. Teens are not afraid to try new things. This makes it easier for them when they eventually leave their _____.

Understanding Claims

Many articles and scientific texts cite research or expert opinions to support claims put forth by the writer. One way to understand the strength of a claim is to look closely at the verbs used. Verbs such as *find (out)*, *point out*, *know*, *discover*, and *conclude* show a high degree of confidence in the claims being presented. Verbs such as *suggest*, *think*, *believe*, and *claim* show a lower degree of confidence.

- SCANNING** A. Look back at Reading A. Find and underline the claims below.
1. A person's brain reaches almost its full size by the age of six.
 2. The brain goes through a process of great change, which actually continues until age 25.
 3. The result of a still-developing and clumsy brain is the unpredictable behavior seen in teenagers.
 4. Teens are more likely to take risks and behave in extreme ways.
 5. The teen brain makes rewards seem more important than risks, and teens feel new experiences more keenly.
 6. In the long run, the impulses of the teen brain help teens live their own lives successfully.



^ A teenage girl in Tokyo's Harajuku area

- UNDERSTANDING CLAIMS** B. Identify and write the verbs in the passage that are used to make the claims in activity A. Then mark each claim as showing a high (H) degree or a lower (L) degree of confidence.

- | | | | | | |
|----------------------------|---|---|----------|---|---|
| 1. <u>discovered</u> _____ | H | L | 4. _____ | H | L |
| 2. _____ | H | L | 5. _____ | H | L |
| 3. _____ | H | L | 6. _____ | H | L |

CRITICAL THINKING *Reflecting* The reading passage states that we take the greatest risks when we are teenagers. At what age do you think people take the fewest risks? What things might affect a person's willingness to take risks? Note your ideas and then discuss with a partner.

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

Psychologist Laurence Steinberg has found that the biggest ¹**reward / risk** takers are 14- to 17-year-olds. This is not because they don't ²**realize / go through** certain activities are dangerous, but because they value the ³**rewards / upgrades** more than the risks. To test this idea, Steinberg uses a video game that involves driving a car. Players have to ⁴**conclude / deal with** traffic lights that change quickly from green to red, forcing quick decisions. The study showed that when a friend was watching, teens took twice as many risks as when they played alone. From this, Steinberg ⁵**went through / concluded** that social rewards can lead teens to take more risks.

WORDS IN CONTEXT

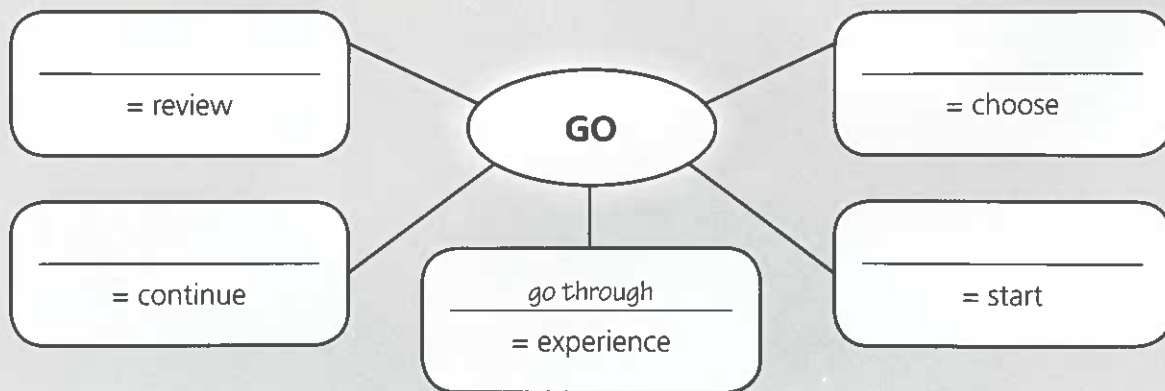
B. Complete the sentences. Choose the correct options.

1. Something that would probably cause great **excitement** is _____.
 - a. falling asleep while reading
 - b. winning a sports event
2. If you **go through** a difficult time, you _____ it.
 - a. avoid
 - b. experience
3. Something that gives many people **pleasure** is _____.
 - a. listening to music
 - b. taking exams
4. When a machine gets **upgraded**, it should work _____.
 - a. better
 - b. worse
5. If a feeling is **intense**, it is very _____.
 - a. strong
 - b. weak

WORD WEB

C. **Go through** is one of many phrasal verbs formed using the verb *go*. Complete the word web using the words in the box. Use a dictionary to help you.

ahead for on over through



BEFORE YOU READ

DEFINITIONS A. Look at the picture and read the caption. Then complete the sentences using the words in **bold**.

1. If two people have something _____, they are the same in some way.
2. A person's _____ is a number that represents their intelligence, based on their score on a special test.
3. If two things are exactly the same, we say they are _____.
4. The growth of our bodies follows a plan contained in our _____.

PREDICTING B. You are going to read about the Jim twins—identical twin brothers who were separated as babies but met when they were adults. In what ways do you think they were similar or different when they met? Discuss with a partner. Read the passage to check your ideas.



< **Identical** twins, like those pictured here, have exactly the same **genes**. This explains the physical features they have **in common**. But some scientists studying twins have concluded that genes can also affect **IQ**, and even personality.

SEEING DOUBLE

- A Many scientists once believed that physical similarities between identical twins are **genetic**, while their personalities, intelligence, and other differences between them are an effect of their environment. But scientists are now discovering that the **boundaries** between genetics and environment are not so clear after all.

The Jim Twins

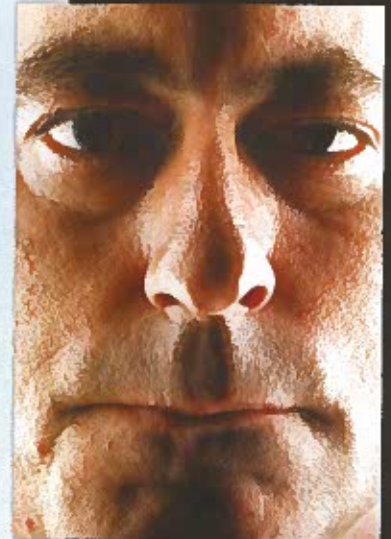
- B Identical twins Jim Springer and Jim Lewis were **adopted** as babies and **raised** by different couples. When the two Jims finally met at age 39, they discovered they had plenty in common. Both were 182 centimeters tall and weighed 82 kilograms. They had the same smile and the same voice. When psychologist Thomas Bouchard Jr. invited the Jim twins to his lab, his **colleagues** found it very hard to **tell** them **apart**.
- C But the similarities didn't stop at the physical. They had both had dogs named Toy. They had both married women named Linda, and then **divorced** them. They had both been sheriffs,¹ enjoyed making things with wood, suffered **severe** headaches, and **admitted** to leaving love notes around the house for their wives. They had so much in common that it seemed unlikely these were just **coincidences**.

Genetics and Intelligence

- D The Jim twins were just one of 137 sets of separated twins Bouchard tested. When they compared the twins' IQ scores, Bouchard and his team reached a surprising conclusion. They concluded that intelligence was mostly connected to genetics rather than to training or education. It seemed the differences in family and environment had little effect.
- E However, genes can't control everything, argues geneticist Danielle Reed, who also studies twins. Reed's research shows that, though nothing can truly change our DNA, environmental differences that a child experiences before birth and in their first year can sometimes affect the way the DNA behaves. This can make even identical twins into vastly different people. "What I like to say is that Mother Nature² writes some things in pencil and some things in pen," she explains. "Things written in pen you can't change. That's DNA. But things written in pencil you can."

¹ A **sheriff** is a kind of police officer.

² **Mother Nature** is sometimes used to refer to nature, especially when it is being considered as a force that affects human beings.



^ Placed side by side, the Jim twins' faces (Lewis on the left, Springer on the right) are so alike that they seem to make a single face.

A. Choose the best answer for each question.

GIST

1. What is the reading mainly about?
- a. how identical twins are formed
 - b. the effects genes have on personality
 - c. the differences between identical twins

DETAIL

2. In the past, scientists believed that ____.
- a. genetics only controlled our appearance
 - b. genetics controlled everything about who we are
 - c. our genes are affected by the environment around us

REFERENCE

3. Who does the word *they* refer to in the second sentence of paragraph D?
- a. the Jim Twins
 - b. sets of twins
 - c. Bouchard and his team

DETAIL

4. According to Bouchard and his team, what is intelligence mostly related to?
- a. genetics
 - b. education
 - c. parenting

VOCABULARY

5. In paragraph E, the word *vastly* is closest in meaning to ____.
- a. unfortunately
 - b. interestingly
 - c. extremely



^ Identical twins, like these young surfers, often share the same hobbies.

SUMMARIZING

B. Complete the summary. Choose the correct options (a–f). One is extra.

- | | | |
|--------------------------|--------------------|---------------------------|
| a. birth | b. DNA | c. levels of intelligence |
| d. physical similarities | e. the environment | f. their meeting |

In the past, scientists who studied identical twins thought that ¹____ were genetic, but other differences, such as personality and intelligence, were caused by ²____. Recent studies show that it is not quite as simple as that. A study by Thomas Bouchard suggests that ³____ are more closely linked to genetics than training or education. However, Danielle Reed's research suggests that the behavior of ⁴____ can be affected by the environment, both before ⁵____ and in a child's first year.

Making Inferences

A reading text does not always state everything directly. Sometimes you need to “read between the lines” to find—or infer—the meaning. You can infer meaning by using your knowledge of the topic, clues and hints in the text, and common sense. An inference is a kind of “smart guess.” Making inferences while reading allows the reader to reach a deeper level of meaning.

MAKING INFERENCES

A. Look back at paragraphs B–D of Reading B. Then read the sentences below about the Jim twins. Can you infer the information below from the information given in the passage? Circle **Yes** or **No**.

- | | | |
|--|------------|-----------|
| 1. The Jim twins have similar personalities. | Yes | No |
| 2. The Jim twins both have sons but no daughters. | Yes | No |
| 3. Bouchard gave the Jim twins an IQ test. | Yes | No |
| 4. The Jim twins got divorced for similar reasons. | Yes | No |
| 5. In Bouchard’s study, most people tested had a similar IQ level to their twin. | Yes | No |

MAKING INFERENCES

B. Use information inferred from the reading passage and your own knowledge to answer the questions below. Check (✓) the option that best matches your opinion.

- Do you think studies like Bouchard’s are common?
 definitely probably probably not definitely not
- Do you think the Jim twins grew up in very different environments?
 definitely probably probably not definitely not
- Do you think geneticists often study identical twins?
 definitely probably probably not definitely not
- Do you think similarities in the Jim twins’ lifestyles were mainly coincidences?
 definitely probably probably not definitely not

CRITICAL THINKING *Justifying Opinions*

Explain the reasons for your answers in activity B.

What information in the reading passage informed your opinion? Make notes below and then discuss with a partner.

COMPLETION A. Complete the information using the words in the box. One word is extra.

admitted adopted apart
boundaries coincidences raised

In 2013, Samantha Futerman—an actress in the United States—received a Facebook message that changed her life. The message was from Anais Bordier, a young woman from France. She told Samantha that she had been ¹_____ as a baby, and thought Samantha could be her twin. When Samantha saw Anais, she ²_____ that they did look very similar. In fact, it was almost impossible to tell them ³_____. The young women found out that they had been born on the same date in the same town in South Korea, and had very similar personalities. To confirm that these weren't just ⁴_____, they took DNA tests, which concluded that they were identical twins. ⁵_____ by different families in different countries, neither had known she had a sister.



The film *Twinsters*—about how Futerman and Bordier discovered they were twins—was released in 2015.

DEFINITIONS B. Complete the sentences. Circle the correct options.

1. If a disease is **genetic**, *your friends / others in your family* are likely to have it.
2. If you have a **severe** pain in your leg, it hurts *a lot / a little*.
3. The **boundaries** of a country are at the *edges / center* of its land.
4. If your parents are **divorced**, they are no longer *alive / married*.
5. Your **colleagues** are people you *live / work* with.

COLLOCATIONS C. The nouns in the box are often used with the word **severe**. Complete the sentences using the correct form of the words in the box.

headache injury problem weather

1. Unemployment is becoming a severe _____ in this country.
2. Fortunately, the accident didn't cause any severe _____.
3. Severe _____ conditions have been forecast for the coming week.
4. If you have a severe _____, it's best to go and lie down in a dark room.

THE GLOBAL VILLAGE

Some of the participants in the National Geographic Society's Genographic Project

BEFORE YOU WATCH

DISCUSSION A. Look at the photos and read the information below about the Genographic Project. Then note answers to the questions and discuss with a partner.

Since 2005, the National Geographic Society's Genographic Project has worked to answer important questions about who we are as human beings, like: *Where did humans come from? How did we come to live all over the Earth?* The project collects DNA from people all around the world and studies it to see what has been passed down from their ancestors. The results provide valuable information about our past.

1. What are some places that people in your country originally came from?

2. What are some possible benefits of learning about our past from our DNA?

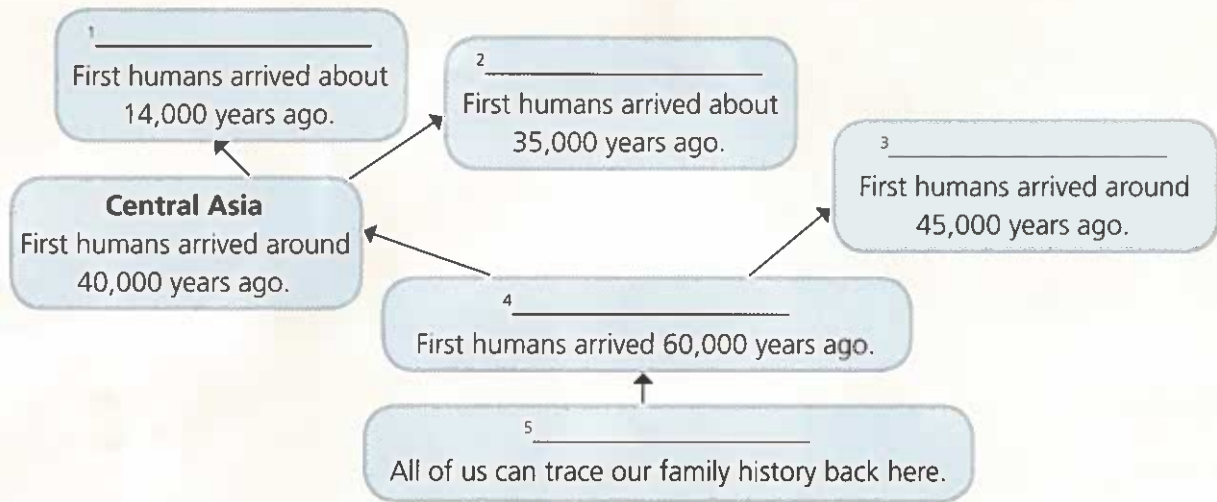
WHILE YOU WATCH

GIST A. Watch the video. Complete the sentences by circling the correct options.

1. The participants are grouped according to where *their ancestors came from / they were born*.
2. Participants are taken on a journey *back / forwards* in time.
3. In the end, all the participants arrive in *Africa / Europe*.

COMPLETION B. Watch the video again. Complete the diagram using the places in the box.

Africa East & South Asia Europe the Americas the Middle East



CRITICAL THINKING Reflecting

What new information did you learn from the video? Did you find anything surprising? Note your ideas below. Then discuss with a partner.

VOCABULARY REVIEW

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

Reading A

- | | | | | |
|------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|-----------------------------------|
| <input type="checkbox"/> conclude* | <input type="checkbox"/> deal with | <input type="checkbox"/> excitement | <input type="checkbox"/> go through | <input type="checkbox"/> intense* |
| <input type="checkbox"/> pleasure | <input type="checkbox"/> realize | <input type="checkbox"/> reward | <input type="checkbox"/> risk | <input type="checkbox"/> upgrade |

Reading B

- | | | | | |
|----------------------------------|----------------------------------|-----------------------------------|---------------------------------------|-------------------------------------|
| <input type="checkbox"/> admit | <input type="checkbox"/> adopt | <input type="checkbox"/> boundary | <input type="checkbox"/> coincidence* | <input type="checkbox"/> colleague* |
| <input type="checkbox"/> divorce | <input type="checkbox"/> genetic | <input type="checkbox"/> raise | <input type="checkbox"/> severe | <input type="checkbox"/> tell apart |

* Academic Word List