CHAPTER 1 The Mysteries of Memory Loss

Before You Read

Memory Quiz

A **How much do you know about the brain and memory? Answer the following questions.**

1 Neuroscience is the study of _____.
   a human behavior **b** the brain **c** memory
2 Which of the following diseases involves memory loss?
   a diabetes **b** anemia **c** Alzheimer's
3 The size of the average human brain has _____ over the last 5,000 years.
   a increased **b** decreased **c** stayed the same
4 Research shows that in most cases, if you damage one part of your brain _____.
   a the other parts of your brain will keep functioning
   b the rest of your brain will be damaged as well
   c the brain will find a way to repair the damage

B **Discuss your answers in A with a partner. Then check your answers at the bottom of page 190.**

Reading Skill

Identifying Main Ideas within Paragraphs

> Many paragraphs are constructed around a main idea. This idea is usually presented in a sentence within the paragraph, usually in the beginning or concluding sentence. Skimming and finding the main idea will increase your speed of reading and comprehension.

A **Skim each paragraph of the passage on the next page. Then write the number of the paragraph (1–6) next to the correct main idea.**

____ Memories are classified as declarative or non-declarative.
____ Doctors are always working to uncover new things about memory and the brain.
____ The case of HM proves people who suffer damage to the hippocampus can still learn.
____ Over time, scientists have had changing ideas about how the brain makes and uses memories.
____ There are severe memory loss conditions that are still a mystery to people.
____ EP and HM are exceptional cases of people with brain damage and memory loss.

B **Discuss your answers in A with a partner. Underline the sentences in each paragraph that helped you find the answer.**

C **Now read the entire passage carefully. Then answer the questions on page 191.**

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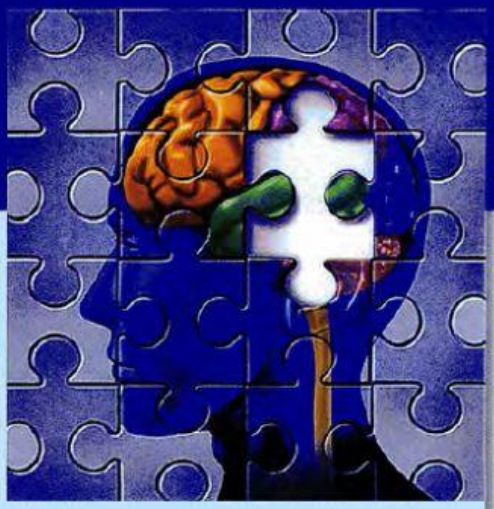
The Mysteries of Memory Loss



1 Many people claim to have a bad memory, and it's true that we have trouble at times remembering where we put our house keys or recalling the names of people we've recently met. But there are those who suffer more serious memory problems, including memory loss over time or memory loss due to injury, disease, or **complications** of surgery. These conditions are still not very well understood by doctors and scientists.

2 Many people experience memory loss as they age. In the past, neuroscientists—doctors who study the brain—had theories about how the brain contained only a certain number of cells and how, over time, these cells might get used up. More recent research suggests that the brain may continue to manufacture new brain cells throughout a lifetime. Also, there is now evidence that damage to the hippocampus—an area of the brain thought to be important in the process of recalling information—may play an important role in memory loss. Studies conducted on patients who have suffered damage to this area of the brain show that while they can still recall memories stored before the brain was damaged, they are unable to remember new facts. In addition, diseases associated with old age, (such as Alzheimer's,) and other problems involving short- and long-term memory loss, are now being **traced** to possible damage to the hippocampus.

3 Two very special patients have helped doctors study memory and the hippocampus in recent years. These two men are referred to only as EP and HM, and each of them suffered memory loss after the loss of this particular section of the brain. HM suffered a head injury as a child and later underwent experimental brain surgery to remove most of his hippocampus. EP, in contrast, contracted a disease that ate away much of his hippocampus. Both men are now unable to form new memories, but they can remember some things from before their traumas. For example, both EP and HM are likely to recall things they learned in school or family memories from their youth, but both will also always think it's the first time they've met you, **no matter** how many times you may have met previously.

LIVEWORKSHEETS

4 Through HM, who has been studied much longer than EP, researchers have learned about different memory abilities. Even though HM couldn't say what he'd had for breakfast or name the current U.S. President, there were some things that he could remember. Scientists found that he was able to learn complicated tasks without even realizing it. In one study, he learned how to recreate a drawing by only seeing the drawing's **reflection** in a mirror. Each time HM did the task, he claimed never to have tried it before. And yet, each day his brain got better at guiding his hand to work in **reverse**.

5 Scientists generally **classify** memories into two categories: *declarative* and *non-declarative*. Declarative memories are things you know you remember, like the color of your car or what happened yesterday afternoon. EP and HM have lost the ability to make new declarative memories. Non-declarative memories are the things you know without **consciously** doing them, like how to ride a bike or how to walk from your bed to your bathroom. Those unconscious memories don't rely on the hippocampus. They happen in completely different parts of the brain. As EP and HM so **strikingly** demonstrate, you can damage one part of the brain and the rest will keep on working.

6 The exact process by which memories are coded and retrieved remains a mystery, but scientists and doctors are working to better understand the brain's remarkable ability to store and recall information.

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Reading Comprehension
Check Your Understanding

A **Choose the correct answers for the following questions.**

1 It is considered a _____ for someone to occasionally forget names or misplace their keys.
- **a** mystery
- **b** normal occurrence
- **c** major problem

2 Which is now thought to be true about brain cells?
- **a** They are limited in number.
- **b** They are constantly being renewed.
- **c** They are slowly used up over the years.

3 What can a patient with hippocampus damage remember?
- **a** the names of his father and mother
- **b** the name of the person he met an hour ago
- **c** what he ate for dinner the night before

4 Which is considered a non-declarative memory?
- **a** reciting a poem
- **b** catching a ball
- **c** recalling a phone number

5 Which is true about HM and his drawing task?
- **a** He can remember how to do the task.
- **b** He can do the task but can't remember that he can do it.
- **c** He remembers doing the task but can't remember how to do it.

B **Read the following sentences. Check (✓) whether they are true for HM and/or EP.**

	This patient...	HM	EP
1	suffered damage to the hippocampus.		
2	was unable to form new memories.		
3	contracted a disease.		
4	got a head injury when he was young.		
5	was studied for a longer time than the other.		

Critical Thinking

C **Discuss the following questions with a partner.**

1 Do you think it is possible for people like HM or EP to lead full lives? Why, or why not?

2 Why is it helpful or important to understand how the brain makes and uses memories?

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Vocabulary Comprehension

Odd Word Out

A **Circle the word or phrase that does not belong. The words in blue are from the passage.**

1	solution	answer	complication	fix
2	no matter	despite	even though	however
3	classify	weaken	fade away	decline
4	aware	conscious	known	ignored
5	recall	connect	trace	link
6	source	origin	root	reflection
7	opposite	reverse	identical	other side
8	boring	shocking	striking	amazing

B **Complete the following sentences with the words in blue from A. You might have to change the form of the word.**

1. Even though they're not twins, it is _____ how similar the sisters look.
2. After her new haircut, Sally was shocked to see her _____ in the mirror.
3. _____ how much you plan ahead, there are always _____ when you move to a new house.
4. Scientists _____ animals into different groups and families.
5. We can't go any further in this direction, so put the car in _____ and back up.
6. Blinking and breathing are things we do without thinking; we aren't _____ of the fact that we're doing them.
7. By examining the crime scene for evidence, police can _____ the crime to the suspect.

Motivational Tip: Set a class goal. Together with your classmates, set a class goal for reading rate and reading comprehension for the next lesson in this unit. How many words-per-minute do you think your class can achieve? What level of comprehension can you achieve? At the end of this unit, check to see if you have met your class goals.

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Vocabulary Skill

The Root Word *fic/fice*

In this chapter you learned the word *sufficient*, meaning *enough*. This word is made by combining the root word *fic*, meaning *to do* or *to make*, with the prefix *suf-* and the suffix *-ent*. *Fic* or *fice* can be combined with other root words, prefixes, and suffixes. Verbs that end in *-fy* are related to the root *fic/fice*.

A **Look at the chart below containing root words and their meanings.**

Root word	Meaning
bene-	good, well
de-	not, away, down
magna- /magni-	great, large
pro-	forward
sign-	to mark, to mean
spec-	to see or look
sub-/suf-	under, beneath

B **Write the parts of speech for the words in the box below. Then, using the chart in A to help you, match the words to the correct definitions. Write a–j.**

a _____	sufficient	**f** _____	magnificent
b _____	beneficial	**g** _____	magnify
c _____	deficit	**h** _____	proficient
d _____	defy	**i** _____	specify
e _____	insignificant	**j** _____	specification

1 _____ to make something appear larger, or to increase its effect
2 _____ too small to be important
3 _____ to refuse to follow orders or do something
4 _____ enough for a specific purpose
5 _____ a requirement which is clearly stated
6 _____ extremely good, beautiful, or impressive
7 _____ helpful or giving an advantage
8 _____ to mention or state in detail
9 _____ skilled in something
10 _____ the amount by which the actual sum is lower than what is expected

C **Complete the following sentences using the words in the box from B.**

1 I saw a _____ exhibit at the Museum of Modern Art yesterday—some of the finest paintings I've ever seen.
2 Danny is _____ in several languages because he lived in many different countries when he was young.
3 Does the class syllabus _____ which unit we should read first?
4 In order to see a human cell properly, you'll need to _____ it.
5 The doctor recommended I take vitamin C because it's _____ to my health.

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