The Brain

The human brain weighs less than four pounds, is made up of more than 100 billion cells, and is the control center of every human being. It keeps humans alive, allows them to experience emotions, and enables them to think and learn. How does this small organ manage to do so much? What should humans do to protect it? Read these informational texts to find out.

Jeanette Leardi has written and edited more than fifty children's educational projects for numerous publishers. Her poetry, essays, feature articles, and book reviews have appeared in many local and national publications.
How to use this book

1. Learn about the genre by reading pages 2–3. Get background information about the articles on page 5. (Shared reading)

2. Read the articles for enjoyment. (Leveled texts)

3. Reread the articles and answer the questions on pages 14–15, 21, and 28–29. (Shared reading)

4. Reread the last article. Pay attention to the comments in the margins. See how an author writes an informational text. (Leveled text)

5. Follow the steps on pages 30–31 to write your own informational text. (Shared reading)

6. Complete the activity on the inside back cover. Answer the follow-up questions. (Shared reading)
**What is an informational text?**

An informational text is a nonfiction text that presents information in an accurate and organized way. It is often about a single subject, such as an event or time period in history or a scientific discovery. It may be about any topic, such as a sport or a hobby. The research report that you write for a school assignment is an informational text. So is an article you read in your favorite fashion magazine or on a Web site. A newspaper account of a local election and a history book chapter on a famous battle are additional examples of informational texts.

**What is the purpose of informational texts?**

An informational text has one main purpose: to inform. The best informational writing does this in a way that keeps readers’ attention. It pulls readers in, making them want to keep reading and to know more about the topic.

**How do you read an informational text?**

When you read an informational text, look for facts and for the details that support them. Read critically to make sure conclusions make sense. If there is more than one way to look at an event or situation, make sure all are given. Ask questions: Did I learn something new from this text? Do I want to know more about it? Can I draw my own conclusions from what I have read?

**Who writes informational texts?**

Writers who know their topic well write good informational texts. They do this by becoming mini-experts on the subjects they are writing about. They make sure that they support the information in their work with historical facts, scientific data, graphics such as time lines and diagrams, and expert evidence. They provide more than one person’s point of view. They use primary sources, firsthand information such as journals and photographs.
Graphic and Text Features

Informational text writers often include graphic and text features to support their ideas and help readers understand what they are saying. Graphic features such as photographs, maps, charts, lists, illustrations, and diagrams help the reader interpret the texts. By interpreting the text, readers make inferences, draw conclusions, build summaries, and identify what is important. Text features such as bullets, captions, subheads, and font changes such as size, italics, or color help readers locate information because it stands out from the main text.

Descriptive Language: Adjectives and Adverbs

Nonfiction authors want to engage readers with their texts as much as fiction authors do. To accomplish this task, they include descriptive language in the form of adjectives and adverbs. Adjectives answer the question: What kind or type? These words include physical descriptors such as enormous and rectangular, observation descriptors such as delicious and expensive, and qualifying descriptors such as touring and basketball. Adverbs answer the questions: How was it done? Where was it done? When was it done? How often was it done? To what extent was it done? Remember, adjectives and adverbs do not take the place of strong verbs and nouns. They merely enhance them.

Make Inferences

Writers don’t explain everything in a story. Often, they provide clues and evidence in their texts and expect the reader to read between the lines, or make inferences. Good readers consider the information the writer provides, then think about other truths the information suggests. To make an inference, look for parts of the text that make you stop and think to yourself, I wonder if the writer is saying that …

About the Brain

Your brain is the control center of your body. Whether it’s eating, sleeping, walking, talking, thinking, feeling, dreaming, learning, remembering, playing, or planning, you do all of it thanks to your brain. Your brain even controls such things as your heartbeat, body temperature, and digestion—activities you’re not even aware of. How does this amazing three-pound organ do all of this and more? How can you keep your brain healthy and strong? Put your brain to work—and read on.
Imagine you want to drive somewhere very far away in the shortest amount of time possible. What route would you take? A series of footpaths, side streets, and dirt roads? Or a superhighway? Now imagine driving on that superhighway, which connects to another superhighway, and another, and another, until you reach the very front door of your destination. And finally, imagine that same superhighway creating new superhighway connections instantaneously to anywhere you want to go. That’s exactly what happens inside the human brain, the most amazing, ever-changing organ in nature.

From the time you are born until the time you die, your brain continuously creates new connections among its cells, called neurons. These connections expeditiously carry electrical signals to and from all the different parts of your body to make those parts move. They also carry electrical signals within the different parts of your brain—and these form your thoughts, feelings, and memories.

The adult human brain has 100 billion neurons. Yet each neuron is so tiny that 30,000 can fit on the head of a pin! Despite its size, the neuron is a complex cell, with three main parts: a cell body, an axon, and 1,000 to 10,000 dendrites. To understand how these neurons work, think of the cell body as a place. The dendrites are one-way superhighways that lead signals into the cell body. The axon is a one-way superhighway that leads signals out from the cell body. Neurons don’t touch each other. There is a microscopic space between them called a synapse. Signals travel from one neuron to another by “jumping” across the synapse with the help of chemicals in the brain.

How fast can a brain signal travel? If you touch a hot stove with your finger, the signal from your finger to your brain telling it that the stove is hot travels at about 270 miles an hour. The signal from your brain back to your hand that pulls it away from the stove travels equally fast. But the signals between neurons in the brain travel at much faster speeds. The average time it takes a signal to cross a synapse is 1/1000th of a second. Because this speed is so fast, you never notice any time passing when you see, taste, touch, hear, or smell something, or do anything else with your brain.
Three “Brains” in One

The human brain is organized into three sections. Each section is in charge of certain body functions. In fact, these three sections act like mini-brains themselves. You might call them your Survival Brain, Emotional Brain, and Thinking Brain.

Your **Survival Brain** is in charge of helping you react quickly at times when you are in danger. Think about it: What does any creature do when it is threatened? It either runs away from the threat or fights to defend itself. Your Survival Brain goes into action immediately when a threat occurs. It speeds up your heartbeat and breathing. It does this to make sure you have enough oxygen flowing through your body to give you the strength to act. It also controls your body’s coordination and balance. It sends signals to your muscles to help you run, jump, push, pull, and do anything else to help you deal with the danger.

Your **Emotional Brain** controls your feelings and many of your body’s daily functions. It tells you when you’re hungry, thirsty, and sleepy. It controls your body temperature. It is also where your emotional reactions occur. It takes in new bits of information and turns them into memories you might need to recall soon afterward. If you don’t use those memories right away, your Emotional Brain converts them into long-term memories you can recall months or even years later. It’s also the part of your brain that signals your body to release hormones. These are special chemicals that help you cope with stress or make you feel excited about good things.

Your **Thinking Brain** is the largest of the three “brains.” It controls your ability to figure things out and plan ahead. It is also the part that allows you to speak, read, write, draw, appreciate music, dream, predict, imagine, and do many other complex activities.

These three “brains” work closely together all the time, thanks to the 600 miles of neurons they contain. These neurons form between 10 trillion and 100 trillion total connections among them. That’s a huge number of superhighways carrying lots of brain-signal traffic!
How Does the Brain Change?

Everyone is born with a brain, of course. But it takes nearly twenty years for a brain to fully develop. When a baby is born, its brain weighs about three-quarters of a pound. By the time that baby is an adult, its brain is four to five times heavier. But weight isn’t the only thing that changes in the human brain. As a baby learns, its brain creates more and more signal superhighways. In fact, each new thought or memory you have creates one or more connections between neurons.

Because a baby’s brain is much smaller than an adult’s, it may seem to have a lot fewer neurons. In fact, a baby’s brain can have twice as many! These start to form before birth in order to prepare the baby for innumerable learning experiences. Until the age of two, children need as many brain cells as possible to learn from all the experiences they will have. Soon after that, the brain begins to lose the neurons it doesn’t need. This process is called “pruning.” Just how many cells and their connections are pruned depends on how stimulating the child’s environment is. A pruned neuron is like a neglected superhighway that becomes cracked or full of potholes. If young children don’t have many opportunities to read books, play with other children, or make decisions, their brain loses much of its ability to think and perform.

As children reach age ten or eleven, most of their brain’s basic abilities have been formed. But something important happens to preteens: Their brains are flooded with new hormones that prepare them to be adults. These hormones can affect the kinds of thoughts they have. This can be a very confusing time for young people. Their brains are challenging them to make decisions about who they want to be and about how to act in the world. It’s no wonder that teenagers are often maligned for being irresponsible and making bad choices. It takes at least twenty years for a human brain to develop good judgment and planning skills.
Many people believe that when they get old their brains will lose a lot of their power. But this is a myth. Brain signals do travel a little slower in older adults. And some older adults lose neuron connections as a result of disease. But most adults’ brains can continue to make new neurons and connections throughout a lifetime—that is, if the person continues to learn and do new things.

Scientists are discovering more each day about how the human brain works. They know that each thought, feeling, experience, and memory you have adds a new superhighway to an already complex road map. And when you change your mind about something, you literally “change your mind.”

And that is an amazing thing.
Reread the Informational Text

Analyze the Information Presented in the Article

- What is the article mostly about?
- What is the main idea for each section of the article?
- The article contains text and graphic features such as boldfaced text and labeled diagrams. How do these features help you understand the article?
- How does the article end?
- Which two pieces of information do you find most interesting? Explain your answer.

Focus on Comprehension: Make Inferences

- What can you infer about synapses?
- Your Survival Brain helps you stay alive. What evidence from the text supports this claim?
- On page 12, the author says that “most adults’ brains can continue to make new neurons and connections throughout a lifetime.” What word in this sentence helps you infer that not all adult brains can continue like this throughout a lifetime?

Analyze the Tools Writers Use: Graphic and Text Features

- On page 7, the author includes a labeled diagram of a neuron. What part of the text does this diagram support? What can you infer from this diagram about how the brain works?
- On page 9, the author includes a labeled diagram of the brain. How does this graphic feature help you understand the text?
- What text features does the author use in this article? Remember, text features help readers locate information.

Focus on Quotation Marks

Quotation marks usually show direct speech, or someone speaking in a story. However, quotation marks may also be used to set off text the author wants to emphasize. In this nonfiction text, the author uses quotation marks several times. On page 7, the author says that signals travel from one neuron to another by “jumping” across the synapse with the help of chemicals in the brain. We don’t really know if signals “jump” in the brain, but this word most closely describes what brain signals do. Identify other instances in this article where the author uses quotation marks to emphasize text. How is this feature helpful to you as a reader?

Focus on Words: Descriptive Language: Adjectives and Adverbs

Make a chart like the one below. Read each descriptive word. Identify if it is an adjective or an adverb and then identify what it describes in the article.

<table>
<thead>
<tr>
<th>Page</th>
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<th>Adjective or Adverb</th>
<th>What the Word Describes</th>
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</thead>
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<tr>
<td>7</td>
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<tr>
<td>7</td>
<td>expeditiously</td>
<td>Adjective</td>
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<td>7</td>
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<td>Adjective</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>innumerable</td>
<td>Adjective</td>
<td></td>
</tr>
</tbody>
</table>
Right Brain, Left Brain

In the mid-1960s, in a laboratory at the California Institute of Technology, psychologist-biologist Dr. Roger Sperry performed an incredible experiment. It dramatically changed everything scientists had known about the human brain.

In the experiment, a man who had recently undergone brain surgery sat before a screen. In the middle of the screen was a black dot. Sperry told the man to look at the dot. Then Sperry flashed a picture of an object on the left side of the screen. Let’s say the object was a spoon. Sperry asked the man to describe what he saw. The man said he didn’t see anything.

What happened next was just as extraordinary. When Sperry asked the man to use his left hand to choose the object he saw from among several objects in front of him, the man grabbed the correct object. But when Sperry asked him to name the object in his left hand, the man couldn’t come up with the word for it. It was only when Sperry flashed the word “spoon” on the right side of the screen that the man could say the word—because he could read it.

What was going on? It turns out that the man had undergone a very special kind of brain surgery. He had been suffering from epilepsy, a disease that causes unpredictable and uncontrollable tightening of the muscles. To cure his disease, surgeons operated on his corpus callosum, an organ deep in the middle of the brain. They cut the organ’s more than 200 million nerves that connected the right and left sides, or hemispheres, of the man’s brain. The man no longer had epilepsy. Instead, he had a disconnected brain with both sides acting independent of each other.

For centuries, scientists have known that the human brain looks as if it is divided into two halves, but they never completely understood why. It wasn’t until Sperry’s experiments that everyone realized just how important this two-part structure is to the way humans think and act. Since then, scientists have learned more and more about the right and left hemispheres, and how they communicate with each other.
The Jobs of the Right and the Left

In general terms, the left hemisphere controls the nerves and muscles of the right side of the body, and the right hemisphere controls the left side. But each hemisphere has the ability to take in and process information in its own way.

The left hemisphere sees the world in a logical, reasonable way. It is the analytical part of the brain that breaks up big objects and ideas into their smaller parts. It prefers to organize tasks into a sequence of smaller steps. And it is great at noticing the differences between any two things. The left hemisphere is characteristically the part of the brain that processes written and spoken language, as well as math.

The right brain sees the world in a nonlogical, intuitive way. That means it typically relies on hunches—what some people call gut feelings—to understand what is going on. Furthermore, the right hemisphere is great at looking at all the parts of an object or idea and seeing the big picture behind them. It can do this because it is especially good at processing colors, faces, pictures, and music. It looks for similarities and patterns between any two things. The right hemisphere also prefers to react to a task spontaneously rather than go through its steps.

How the Hemispheres Work Together

Both hemispheres work together to process almost every thought a person has. That is because most thoughts are complicated. If you are reading a book, chances are that you are also mentally creating a picture of what the sentences are describing. And when you look at a photo of a loved one, you may imagine hearing the way that person speaks or laughs.

People often label someone as being “right-brained” or “left-brained.” They don't mean that only one half of that person's brain works. What they are really saying is that the person has a decided preference in the way he or she understands and uses information. Most people do. A left-brained person may like to read and write and solve math problems. A right-brained person may prefer to draw, paint, take photos, and listen to music. A left-brained person needs to make shopping lists and term paper outlines. A right-brained person prefers to browse in the store and write a term paper as his or her thoughts come.
Is One Hemisphere Better?

Scientists today know that neither preference is better than the other. But author and art teacher Dr. Betty Edwards explains that this is a recent view. In her book *Drawing on the Right Side of the Brain*, she writes that for centuries, people in Europe and America mistakenly believed that being right-handed (left-brained) was superior to being a lefty (right-brained). Even their languages reflected this bias. For example, the Latin word *dexter* means “right.” Someone who is “dexterous” is skillful. A *sinister* person (the Latin word for “left”) is evil and creepy. For years, parents and schoolteachers tried to force left-handed children to write with their right hands. Even today, most education is still based on logical reasoning, and it focuses less on music, art, and other nonverbal subjects. According to Dr. Sperry, “modern society discriminates against the right hemisphere.”

One thing is certain: It’s important to develop the skills of both hemispheres as much as possible. If someone says, “Come over to my house for lunch,” you need the left side of your brain to understand the invitation. But only the right side can identify who invited you. Without a doubt, two hemispheres are truly better than one.

### Characteristics of Each Hemisphere

<table>
<thead>
<tr>
<th>Left Hemisphere</th>
<th>Right Hemisphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>relies on logic, reasoning</td>
<td>relies on intuition, hunches (gut feelings)</td>
</tr>
<tr>
<td>processes speech, written language, math</td>
<td>processes pictures, colors, faces, and music</td>
</tr>
<tr>
<td>detects differences between two things</td>
<td>finds similarities between two things</td>
</tr>
<tr>
<td>seeks to divide things into parts</td>
<td>looks for overall patterns and shapes</td>
</tr>
<tr>
<td>plans and does tasks in a sequence</td>
<td>acts spontaneously</td>
</tr>
</tbody>
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## Analyze the Information Presented in the Article

- What is the article mostly about?
- What is the main idea for each section of the article?
- The article contains text and graphic features such as subheadings and charts. How do these features help you understand the article?
- Which two pieces of information do you find most interesting? Explain your answer.

## Focus on Comprehension: Make Inferences

- The man in the experiment went from a terrible disease to a chronic problem. What information in the text supports this inference?
- More experiments on the brain’s hemispheres have been conducted since the one in this article. How can you tell?

## Analyze the Tools Writers Use: Graphic and Text Features

- The author includes a labeled diagram of the left and right hemispheres on pages 16–17. What part of the text does this diagram support?
- What can you conclude from the information in the chart titled “Characteristics of Each Hemisphere”?
- The words *corpus callosum, dexter, and sinister* are italicized in this article. What do these words have in common?

## Focus on Words: Descriptive Language Adjectives and Adverbs

Make a chart like the one below. Read each descriptive word. Identify if it is an adjective or an adverb and then identify what it describes in the article.

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<tr>
<td>18</td>
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<tr>
<td>20</td>
<td>over</td>
<td>adjective</td>
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A year ago, Luis Alvarez, age seventy-five, suffered a serious brain injury. He had a stroke and lost the use of the right side of his body. He also couldn’t read, speak, or write. Today, however, he’s on the road to recovery. With the help of intensive physical and speech therapy, Alvarez can now walk. He can also read easy books and write legible, simple sentences. And he can speak slowly and steadily.

Marge Chan recently died of heart failure at the age of ninety-six. She was a very friendly person with an active life as a math teacher and a community volunteer. She was also a lifelong, avid reader with a sharp wit. When doctors examined her to determine the immediate cause of her death, they were astounded. In addition to her heart problems, Chan also had advanced Alzheimer’s disease. The incurable brain illness almost always causes severe memory loss, poor balance, and sudden mood changes. Alzheimer’s also causes a gradual shutting-down of such bodily functions as digestion.

What caused Alvarez to recover, and why didn’t Chan show any symptoms of Alzheimer’s?

The “Plastic” Brain

These two stories illustrate a very special characteristic of the brain: plasticity. In science, something is considered to be plastic if it can be bent or molded or changed. Consider how plastic water bottles are formed. Liquid plastic is poured into bottle-shaped molds. When the plastic dries, it retains that bottle shape. But the plastic can be remelted and made into other things.

It’s similar with your brain. When a part of the brain that controls a certain activity, such as speech, is damaged, sometimes another part of the brain takes over that role. That’s what happened in Luis Alvarez’s case. Through rigorous practice, he trained another part of his brain to become its speech center. He also trained other parts of his brain to help him move the paralyzed side of his body.

As for Marge Chan, perhaps she didn’t show any Alzheimer’s symptoms because of her active life. She used math daily, read lots of books, socialized with friends, and helped others. Her brain neurons had formed billions of “superhighway” connections. As a result, these connections served as new signal routes, taking the place of the roadways damaged by Alzheimer’s disease.
Protecting Your Brain

People like Luis Alvarez and Marge Chan are fortunate. There are limits to a brain’s plasticity. But doctors now know lots of ways you can protect and nurture your brain to keep it healthy and strong.

Your brain is protected by the skull and a layer of fluid. But if your skull cracks or is badly shaken or bruised, your brain will be injured. So it’s extremely important to always:

• wear a seat belt whenever you ride in a car,
• walk across streets safely,
• wear a helmet while bike riding and skateboarding, and
• wear protective gear when playing baseball, football, and hockey.

Exercise caution when doing activities in which you can fall and seriously harm your brain. You should not dive into shallow water. And of course, ingesting toxic chemicals or illegal drugs can cause irreparable damage.

Other Ways to Care for Your Brain

It’s not enough to protect your brain. It is a complex organ of chemicals, blood vessels, and nerves. These work together to keep the brain in balance so it can perform all its vital tasks. Three major things are necessary to keep your brain healthy and strong: a proper diet, good exercise, and enough sleep.

Certain foods such as salmon, sardines, and nuts supply your brain with good fats. These fats, called omega-3s, keep your neuron connections healthy. Colorful foods, such as blueberries, strawberries, bell peppers, and dark, leafy green vegetables, help your neurons repair themselves and grow. One food that can harm the brain is sugar. Eating or drinking too much of it leads to chemical imbalances. These can interfere with your ability to think, learn, and remember.

Eating the right foods is only one way to keep your brain healthy. Getting enough physical and mental exercise is equally important.
According to the Franklin Institute, a leading science learning center, “Nearly half of young people ages 12 to 21 do not participate in vigorous physical activity on a regular basis.” Your heart pumps blood and oxygen into your brain, which it needs to form many more neuron connections. As University of Illinois psychology professor Art Kramer says, “Fitness changes the building blocks of the brain’s structure.”

You also need to keep your brain mentally stimulated. People disagree, however, on the best way to do this. Some video and online computer game companies believe their products provide enough stimulation. Some researchers disagree. They say mental exercises should involve learning. Psychology and neuroscience professor Philip Adey says, “To stimulate the intellect, you need a real challenge. Getting smart is hard work.” Professor Kramer believes mental exercises need to relate directly to a person’s life. “Learning is very specific,” he says. “Unless the component you are trained in actually exists in the real world, any transfer [of learning] will be pretty minimal.”

In addition to good food and exercise, you need at least eight hours of uninterrupted sleep each night. That’s when your body rests. Your brain sends out hormones that help repair your body from the challenges and stresses of the day.

And as you dream, your brain is reorganizing its new neuron connections.

Scientists today know a lot about the human brain. But some things about it are still mysteries. As human beings, Luis Alvarez, Marge Chan, and you have a lot in common. And yet each of you is unique. Scientists have yet to determine, for instance, where in the human brain an individual’s personality is found.

It’s a good thing we know how to maintain healthy and strong brains. By doing so, people will stay smart enough to discover more about this truly fascinating part of the human body.

Researchers agree that it’s important to keep your brain mentally stimulated; they just don’t agree on the best way to accomplish this.
Analyze the Information Presented in the Article

- What is the article mostly about?
- What is the main idea for each section of the article?
- The article contains text and graphic features such as a bulleted list and photographs. How do these features help you understand the article?
- How does the article end?
- Which two pieces of information do you find most interesting? Explain your answer.

Focus on Comprehension: Make Inferences

- What can you infer about sugar from the information on page 25? Should you avoid sugar completely? How can you tell?
- There must be bad fats. How can you tell?
- Professor Kramer would rather see a person repair a leaky kitchen faucet for the first time instead of playing the same video game for the fourth time. How can you tell?

Analyze the Tools Writers Use:
Graphic and Text Features

- Why does the author italicize the word “sometimes” on page 23? How does this text feature help you understand the text better?
- On page 27, the author includes a photograph of a person working on a cube puzzle. What part of the text does this graphic feature support?
- What information does the author include in the bulleted list on page 24? How does the list help you locate the information?

Focus on Words: Descriptive Language: Adjectives and Adverbs

Make a chart like the one below. Read each descriptive word. Identify if it is an adjective or an adverb and then identify what it describes in the article.

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<tbody>
<tr>
<td>22</td>
<td>steadily</td>
<td>Adjective</td>
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<tr>
<td>23</td>
<td>rigorous</td>
<td>Adjective</td>
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<tr>
<td>25</td>
<td>vital</td>
<td>Adjective</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>uninterrupted</td>
<td>Adjective</td>
<td></td>
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</tbody>
</table>
Reread “Keeping Your Brain Healthy and Strong” and think about what Jeanette Leardi did to write this informational text. How did she keep a narrow focus? How did she help you understand the text?

1. **Decide on a topic.**
   Choose something you are interested in and want to know more about. Good writers enjoy researching their topics.

2. **Narrow your focus.**
   Jeanette Leardi knew she couldn’t write about everything there was to know about the brain, so she narrowed her focus to ways to keep the brain healthy and strong.

3. **Write a question about your focus.**
   Questions lead to answers, so turn your focus into a question.

4. **Research your focus.**
   Become the “expert” by reading articles on the Internet, books, newspaper articles, and interviewing people connected with your topic. For instance, Jeanette Leardi interviewed senior citizens with brain disorders and scientists who study the brain.

5. **Organize your information.**
   Before writing an informational article, make a chart or table like the one on the opposite page that outlines the main points. For each main point, identify supporting details. You don’t have to write full sentences. These are your notes. Remember, however, that there should be a logical progression of ideas.

### How does an author write an Informational Text?

**6 Write your informational text.**
As you write, develop each main point with your supporting details. Remember, you want people to enjoy reading your article as well as learn something new.

**Topic:** Keeping your brain healthy

**Focus:** Protecting and caring for the brain

**Question:** What are some ways to keep the human brain healthy?

<table>
<thead>
<tr>
<th><strong>Main Point</strong></th>
<th><strong>Details</strong></th>
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</table>
| Introduction: Brief profile of two senior citizens with brain illnesses | Luis Alvarez, 75, stroke victim, recovering  
Marge Chan, 96, brain showed Alzheimer’s disease, but she had no outward symptoms. |
| “Plastic” brain | Explain how brain can change and adapt.  
Graphic: MRI scan to show cross sections of brains—normal brain and brain with Alzheimer’s |
| Protect the brain | List situations that require headgear and good safety precautions. |
| Care for the brain | Diet, exercise, sleep  
Interviews with experts in the field (show multiple perspectives): Franklin Institute; U. of I. prof. Kramer; neuroscience prof. Adey |
| Conclusion | We need to keep our brains strong and healthy if we are to continue to learn more about this fascinating part of the human body. |
Glossary

almost (AUL-most) very nearly but not entirely or exactly (page 18)

analytical (a-nuh-LIH-tih-kul) relating to the mental process of examining things or concepts by their individual parts (page 18)

continuously (kun-TIN-yoo-us-lee) in effect or operating without a break in time (page 7)

decided (dih-SY-ded) unquestionable; free from doubt or wavering (page 19)

expeditiously (ek-speh-DIH-shus-lee) with efficient promptness; with reliable speed (page 7)

innumerable (ih-NOOM-ruh-bul) too many to be numbered; countless (page 10)

instantaneously (in-stun-TAY-nee-us-lee) without any perceivable passage of time; very quickly (page 6)

microscopic (my-kruh-SKAH-pik) so small as to be invisible without the use of a microscope (page 7)

over (OH-ver) from one place to another, as in someone’s home (page 20)

rigorous (RIH-guh-rus) marked by strict standards and precision; disciplined (page 23)

steadily (STEH-dil-ee) with an even pace or manner (page 22)

uninterrupted (un-in-tuh-RUP-ted) not made to stop at any time; without a break (page 26)

vital (VY-tul) necessary to life; extremely important (page 25)

Make Connections Across Texts

Complete a graphic organizer like the one below.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Main Points</th>
<th>Author’s Purpose</th>
<th>Graphic Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Amazing Human Brain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Brain, Left Brain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keeping Your Brain Healthy and Strong</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analyze the Informational Texts

Use your graphic organizer to help you answer these questions.

- Does the author’s purpose tell a complete story of the human brain? Explain.
- What other details would you include? Why?
- How did each article address progress in understanding how the brain functions?
- How are the first and second articles alike? How are they different?
- How are the article beginnings alike? What purpose do they serve?
- What can you conclude about the graphic features?
Three Informational Texts About the Human Brain

The human brain weighs less than four pounds, is made up of more than 100 billion cells, and is the control center of every human being. It keeps humans alive, allows them to experience emotions, and enables them to think and learn. How does this small organ manage to do so much? What should humans do to protect it? Read these informational texts to find out.

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- Teen Reflections, Then and Now

Persuasive Essays
- Energy Sources for the 21st Century
- The Best Place to Live: City, Country, Suburbs

Reviews: Art
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  - Claude Monet
  - Edgar Degas
  - Mary Cassatt
  - Vincent van Gogh
- Dutch Masters
  - Frans Hals
  - Johannes Vermeer
  - Rembrandt van Rijn

Jeanette Leardi has written and edited more than fifty children’s educational projects for numerous publishers. Her poetry, essays, feature articles, and book reviews have appeared in many local and national publications.