

## GUIDED PRACTICE

**PRACTICE** Read the following passage from beginning to end. Then, read and answer the questions in the strategies column.

### STRATEGIES

### The Science of Sleep

1. What four things should you look for as you read? Underline the main idea sentence that tells you.
  2. What happens during the first stage of sleep? Underline key details that explain what happens.
  3. Underline the sequence word that signals that a new stage in the sleep process will be described.
  4. Which stage of sleep is described in this paragraph? Underline the name of the stage.
- 1 We spend approximately one third of our lives sleeping, yet few of us know much about that quiet, peaceful state. Fortunately, scientists have investigated the mystery, and they have a few things to tell us. Scientists study sleep by connecting volunteers to electroencephalograms (EEGs), machines that record brain activity. Whenever we think or move a muscle, our brain neurons, or nerve cells, fire tiny electric charges, which an EEG records as brain waves. These waves are represented on computers or on EEG paper as continuous lines. There are different kinds of brain waves, each of which is defined by the speed at which the wave moves. Scientists measure brain waves in cycles per second, or cps. When we are awake, our brains are extremely active, and brain waves appear as rapid, irregular marks on the EEG. During sleep, brain activity slows down and generates regular patterns on the EEG. Based on the characteristics of brain waves, scientists have divided sleep into four principal stages.
  - 2 When we first fall asleep, we enter stage 1, a transition between wakefulness and sleep that lasts 5 to 10 minutes. Our brains slow down and begin producing what are called theta waves, which move at 3 to 7 cps. During this stage, our muscles relax and a state called flaccid paralysis develops. Basically, this means large muscles, such as those in our arms and legs, cease to be under our control. It is easy to wake a person in stage 1 sleep.
  - 3 Next, we enter stage 2. Our brain waves slow through the theta range and show occasional spikes in size or amplitude. Conscious awareness of the world around us disappears. We spend about half of our sleep time in stage 2. As our brains continue to slow down, they start producing delta waves, which move at 3 cps or fewer.
  - 4 Stage 3 starts when at least 20 percent of brain waves are delta waves. Some lists show an additional stage during which at least 50 percent of the waves are deltas. The deepest sleep happens during this stage. Heart and respiration rates and body temperature reach their lowest points. If we are awakened during delta sleep, we may feel disoriented for a few minutes. After a period of deep sleep, our brains



begin to wake up, reversing the stages we passed through as we fell into deep sleep. However, on repeat cycles we go into an important stage known as REM (rapid eye movement) sleep instead of stage 1.

- 5 During REM sleep, our eyes begin to move rapidly from side to side, although our eyelids remain closed. Meanwhile, heart rate, respiration rate, and body temperature increase and become irregular. During REM sleep we have our most vivid dreams. Our brains become more active, almost as active as they are when we are awake. Our fingers and hands may twitch, but our major muscles become paralyzed. Young people and adults spend about 20 percent of their sleep time in REM sleep. Infants may spend half of their time in REM.
- 6 A full sleep cycle lasts about 90 to 110 minutes and then repeats five or six times each night. During the first part of the night, we spend more time in deep sleep and less time in REM. As the night progresses, we spend less time in deep sleep and increasingly more time in REM sleep.



**GED PRACTICE** Write each event in the box of the stage in which it occurs during the sleep cycle.

- Vivid dreams occur.
- The brain produces theta waves and then delta waves.
- Flaccid paralysis develops.
- At least 20 percent of brain waves are delta waves.

1. Stage 1	2. Stage 2	3. Stage 3	4. REM sleep

5. What signal word in this paragraph tells you that different events are happening at the same time? Underline it.

**Answers and explanations start on page 75.**

# GED APPLICATION

**PRACTICE** Read the passage. Answer the questions that follow.

## Lewis and Clark Cross the Bitterroots

- 1 Before 1803, the United States occupied only the eastern half of North America. The country's western border was represented by the Mississippi River, with lands farther west still owned by France. President Thomas Jefferson wanted to gain control of that land and of the Mississippi River. In 1803, France offered to sell the land, and Jefferson quickly bought it in what became known as the Louisiana Purchase.
- 2 Jefferson didn't know exactly what he was buying because so much of the land west of the Mississippi remained unexplored. No one knew what the land held or even its true size. To learn more about his purchase, Jefferson organized a group of explorers, calling them the Corps of Discovery. In command were Meriwether Lewis and William Clark.
- 3 In 1804, Lewis and Clark set out from St. Louis. The first part of the journey was by water. They traveled up the Missouri River as far as they could. After leaving the river, they started the overland part of their cross-country journey. Soon, they reached the Bitterroot Mountains in what is now Idaho and Montana. On September 11, 1805, they began their trek through the mountains—a dangerously late time of year to begin such a crossing. Even before entering the mountains, the expedition was running low on food. They had maintained insufficient supplies of food for their horses, so the explorers let the animals forage for grass at night. That forced the men to waste precious time finding their horses again in the morning.
- 4 On September 14, the weather turned bad. The travelers endured rain, snow, and hail. Then, their guide lost the trail. When they camped, they were exhausted. The next day, the group found the trail again. They climbed steep mountainsides on which the trail was often on the edge of a drop-off; any stumble could have proven deadly. The group made only twelve miles' progress that day. They needed to move faster before bad weather caught them.



- 5 Having already endured great physical hardship, the men were unprepared for what was to come the next day, September 16. The snow began before dawn, and it did not stop all day. In such conditions, the trail was hard to see. In the days that followed, the expedition stumbled on through the mountains. The horses were starving and weak, and the explorers were in equally poor condition. Several times, they had to slaughter a horse to feed themselves. However, this was only a temporary solution, because soon they were down to a dangerously low number of horses, and they needed their few remaining ones to carry supplies.
- 6 As the people and horses grew weaker and weaker, the journey became harder and they covered fewer miles. It was difficult to keep going, but they had no choice. Miserable as they were, they got up each day and struggled on. Finally, on September 22, the travelers reached the end of the Bitterroots. They had traveled 160 miles through some of the most rugged country in North America.



**GED PRACTICE** Circle the letter of the option that correctly answers each question.

1. **Why did Lewis and Clark explore the land west of the Mississippi?**
  - A. to find out more about the land acquired in the Louisiana Purchase
  - B. to take part in an expedition that included President Thomas Jefferson
  - C. to look for a water route from the Mississippi to the Bitterroot Mountains
  - D. to claim the land that is now Idaho and Montana for the United States
2. **Which event in Lewis and Clark's journey occurred first?**
  - A. Lewis and Clark began their journey overland.
  - B. Lewis and Clark encountered snowy weather.
  - C. Lewis and Clark entered the mountains.
  - D. Lewis and Clark traveled up the Missouri River.
3. **Which of the following events occurred on September 15, 1804?**
  - A. Members of the expedition lost their horses and had to search for them.
  - B. The expedition was able to pick up the trail the guide had lost in the snow.
  - C. A blizzard forced the expedition to stop climbing the mountains and find shelter.
  - D. A member of the expedition was injured after slipping and falling down a steep cliff.

**Answers and explanations start on page 75.**