Do Fish Sleep?

It is fairly easy to tell whether a person is sleeping. Does he have his eyes closed? Is she lying down? If the answer to either of those questions is “no,” you can be fairly sure that the person is not sleeping. But what about fish? Fish do not have eyelids. Fish do not lie down. How can you tell whether a fish is sleeping?

One way you can tell if an animal is sleeping is by studying its brain waves. When human beings or other mammals fall asleep, the pattern of their brain waves changes. However, mammals have different brains than fish. Humans and other mammals have complex brains. A fish’s brain is much less complex than a mammal’s brain. Because fish have simple brains, they do not have the same types of brain waves as mammals. A fish’s brain waves do not change when the fish is asleep. This means that we cannot tell if a fish is sleeping by looking at its brain waves. This also means that fish do not really sleep in the same way that people and other animals do.

Although fish may not sleep like people, they do rest. One way to tell if a fish is resting is to watch what it is doing. Most fish will slow down when they are resting. Some fish move toward the bottom of the water. Some float near the top of the water. Some even hide in seaweed or patches of coral to rest. If you have ever had a pet fish, you might have noticed that it will rest near the bottom of the tank for a few hours every night. When the fish rests, it makes very small movements with its fins to keep itself in one place. By staying in one place, the fish is able to rest even though it does not look like it is actually asleep.

While you can tell some fish are resting because they stay in one place, other fish never seem to stop moving. Some sharks, for example, need to keep swimming in order to keep oxygen flowing into their gills. Because sharks always need to keep moving, they do not ever seem to sleep. Although sharks are always swimming, they may still be resting. The organ that helps the sharks to swim is located in their spinal cord, not their brain. This means that the sharks might actually be sleeping, in a way—their brains may be resting even though their bodies are still moving.

Another way to tell that a fish is resting is to watch how it reacts to things that happen to it. When a fish is resting, it will respond much more slowly. In 2007, a group of scientists studied the sleeping habits of zebrafish. They gave the zebrafish mild electric shocks when they were fully awake and while they were resting. They discovered that the fully awake zebrafish reacted much more quickly to the shocks than the resting fish. If you have a pet fish at home, you can try a similar experiment. Try giving your fish some food when it is resting. It should take much longer for the fish to notice that there is food in its tank than it does when the fish is fully awake.

Sleeping allows the body to regain energy and keeps the brain healthy and working properly. Although not every living creature sleeps the way human beings do, most need to have some sort of rest. Fish may not look like they are sleeping, but they do have their own ways of getting some rest.

1) As used in paragraph 2, what is the relationship between the words simple and complex?

A. complex is the superlative of simple—this means that something complex is very simple
B. simple is the superlative of complex—this means that something simple is very complex
C. they are synonyms—they have the same meaning
D. they are antonyms—they have the opposite meaning
2) According to the passage, some sharks never stop moving because they

A. do not need to sleep
B. can only take in oxygen when they are swimming
C. do not use their brains to swim; they use their spinal cords instead
D. are always hunting for food

3) Based on the information presented in the passage, why can it be hard to tell when fish are sleeping?

I. fish do not close their eyes
II. a fish’s brain waves are the same whether they are asleep or awake
III. fish do not stay in one place

A. I and II only
B. II and III only
C. I and III only
D. I, II, and III

4) The main purpose of paragraph 5 is to

A. describe a scientific experiment that shows why fish do not sleep the same way that humans do
B. show readers feeding a fish is better than giving it electric shocks
C. explain one way of knowing whether a fish is resting or not
D. prove to readers that they can do scientific experiments at home

5) Imagine that the author wanted to include this piece of information in the passage: “When the parrotfish is ready to rest, it will make itself a ‘sleeping bag’ out of mucus that protects it from predators.” Into which paragraph would this information fit best?

A. paragraph 2
B. paragraph 3
C. paragraph 4
D. paragraph 5

6) Based on the information in the passage, explain in your own words how to tell if a fish is resting. What are some of the main signs?

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7) The author of the passage explains one way readers can test the resting behavior of fish at home. Can you think of another way you could examine a fish's resting behavior? Explain what you could do with your own pet fish.

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8) How would your life be different if you were never able to sleep? Would this be enjoyable? Why or why not?

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1)  **D**  
**Question Type: Vocabulary**  
In paragraph 2, the author writes: “Humans and other mammals have complex brains. A fish’s brain is much less complex than a mammal’s brain. Because fish have simple brains, they do not have the same types of brain waves as mammals.” According to the author, the fish, humans and other mammals have different brains. The author describes human brains as “complex,” but says that fish have “much less complex” brains. Fish brains are described as “simple.” A human’s brain is complex; a fish’s brain is simple—in other words, much less complex. A fish’s brain is not complex; it is simple. Therefore, complex and simple must be antonyms (opposites). Therefore **(D)** is correct. The passage does not provide information to support choices **(A)**, **(B)**, or **(C)**. Therefore they are incorrect.

2)  **B**  
**Question Type: Detail**  
To answer this detail question correctly, we must find the place in the passage where the author first mentions fish that never seem to stop moving. A good way to do this is to scan the first sentence of each paragraph, as the first sentence usually tells readers what the rest of the paragraph will be about. By scanning the passage quickly, we can see that the first sentence of paragraph 4 is: “While you can tell some fish are resting because they stay in one place, other fish never seem to stop moving.” As the paragraph continues, the author writes: “Some sharks, for example, need to keep swimming in order to keep oxygen flowing into their gills.” The author here tells us that sharks never stop moving because they only take in oxygen when they are swimming. Therefore **(B)** is correct. The passage never claims that sharks do not need to be sleeping. In fact, the final sentence of paragraph 4 says: “sharks might actually be sleeping, in a way—their brains may be resting even though their bodies are still moving.” Therefore **(A)** is incorrect. Although the author does explain in paragraph 4 that sharks use an organ in their spinal cord to swim instead of their brains, the author does not claim that this fact causes the sharks never to stop moving. Therefore **(C)** is incorrect. The passage never states that sharks do not stop moving because they always hunting for food. Therefore **(D)** is incorrect.

3)  **A**  
**Question Type: Global**  
In the first paragraph, the author says that one way of telling whether a person is sleeping is by seeing whether or not he has his eyes closed. The author then writes: “But what about fish? Fish do not have eyelids.” Because fish do not have eyelids, they cannot close their eyes. Since they do not close their eyes, you cannot look at their eyes to tell whether or not they are sleeping. This supports option **(I)**. In paragraph 2, the author writes: “A fish’s brain waves do not change when the fish is asleep. This means that we cannot tell if a fish is sleeping by looking at its brain waves.” Because a fish’s brain waves do not change when it falls asleep, you cannot tell whether a fish is asleep or awake just by looking at its brain waves. This supports option **(II)**. The author then goes on to say: “The fully awake zebrafish reacted much more quickly to the shocks than the resting fish.” The author then tells readers what the experiment was: “In paragraph 5, the author writes: “Another way to tell that a fish is resting is to watch how it reacts to things that happen to it. When a fish is resting, it will respond much more slowly.” The author then tells readers about a scientific experiment done on zebrafish that related to this idea. The author says that scientists gave the zebrafish mild electric shocks when they were awake and while they were resting. According to the author, “the fully awake zebrafish reacted much more quickly to the shocks than the resting fish.” The author then gives readers with pet fish a way to try it at home: “try giving your fish some food when it is resting. It should take much longer for the fish to realize that there is food in its tank than it does when the fish is fully awake.” These sentences show us that paragraph 5 is about how resting fish respond less quickly to things that happen to them. Seeing how much more slowly a fish responds to something is one way of knowing whether it is resting. Therefore **(C)** is correct. Although paragraph 5 does describe a scientific experiment, this experiment does not show why fish do not sleep like human do. The experiment shows that resting fish respond less quickly to things that happen to them. Therefore **(A)** is incorrect. Although a fish probably enjoys getting food more than it enjoys getting electric shocks, the author is not trying to show readers that it is better to feed a fish than to shock it in paragraph 5. Based on the above information, we can tell that the main idea of paragraph 5 is to explain to readers that the speed at which a fish responds to something is one way of knowing whether it is resting. Therefore **(B)** is incorrect. Although paragraph 5 does contain an example of a way readers can do an experiment at home, the author’s main purpose in this paragraph is not to prove to readers that they can do scientific experiments at home. Based on the above information, we can tell that the main idea of paragraph 5 is not to explain to readers that the speed at which a fish responds to something is one way of knowing whether it is resting. Therefore **(D)** is incorrect.

4)  **C**  
**Question Type: Inference**  
In paragraph 5, the author writes: “Another way to tell that a fish is resting is to watch how it reacts to things that happen to it. When a fish is resting, it will respond much more slowly.” The author then tells readers about a scientific experiment done on zebrafish that related to this idea. The author says that scientists gave the zebrafish mild electric shocks when they were awake and while they were resting. According to the author, “the fully awake zebrafish reacted much more quickly to the shocks than the resting fish.” The author then gives readers with pet fish a way to try it at home: “try giving your fish some food when it is resting. It should take much longer for the fish to realize that there is food in its tank than it does when the fish is fully awake.” These sentences show us that paragraph 5 is about how resting fish respond less quickly to things that happen to them. Seeing how much more slowly a fish responds to something is one way of knowing whether it is resting. Therefore **(C)** is correct. Although paragraph 5 does describe a scientific experiment, this experiment does not show why fish do not sleep the same way humans do. The experiment shows that resting fish respond less quickly to things that happen to them. Therefore **(A)** is incorrect. Although a fish probably enjoys getting food more than it enjoys getting electric shocks, the author is not trying to show readers that it is better to feed a fish than to shock it in paragraph 5. Based on the above information, we can tell that the main idea of paragraph 5 is to explain to readers that the speed at which a fish responds to something is one way of knowing whether it is resting. Therefore **(B)** is incorrect. Although paragraph 5 does contain an example of a way readers can do an experiment at home, the author’s main purpose in this paragraph is not to prove to readers that they can do scientific experiments at home. Based on the above information, we can tell that the main idea of paragraph 5 is not to explain to readers that the speed at which a fish responds to something is one way of knowing whether it is resting. Therefore **(D)** is incorrect.

5)  **B**  
**Question Type: Global**  
A good strategy for answering this question is to scan quickly the first few sentences of each paragraph, as the beginning of a paragraph usually gives you a good idea of what the rest of the paragraph is about. Paragraph 3 begins: “Although fish may not sleep like people, they do rest. One way to tell if a fish is resting is to watch what it is doing.” The first two sentences of this paragraph tell us that the paragraph will be about how to know if a fish is resting by watching what it does. We can tell that the rest of the paragraph will likely be about different ways you can tell that a fish is resting just by looking at it. The author goes on to say: “Most fish will slow down when they are resting. Some fish move toward the bottom of the water. Some float near the top of the water. Some even hide in seaweed or patches of coral to rest.” The information about the parrotfish in the question is an example of how one fish rests. If you were to see a parrotfish covering itself in a mucus “sleeping bag,” you would know that it was probably resting. Because this is a specific example of a way you can tell that a fish is sleeping just by looking at it, this information would fit best in paragraph 3. Therefore **(B)** is correct. The first sentence of paragraph 2 is: “One way you can tell if an animal is sleeping is by studying its brain waves.” This tells us that the paragraph is likely about a fish’s brain waves. The information in the question is a specific example of a way you can tell that a fish is sleeping just by looking at it. Based on the above information, we can see that this type of fact would fit best in paragraph 3. Therefore **(A)** is incorrect. Paragraph 4 begins: “While you can tell some fish are

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resting because they stay in one place, other fish never seem to stop moving. Some sharks, for example, need to keep swimming in order to keep oxygen flowing into their gills. As the paragraph continues, the author explains about how sharks are able to rest even though they never stop swimming. This paragraph is about how sharks rest while they move. The information in the question is a specific example of a way you can tell that a fish is sleeping just by looking at it. Based on the above information, we can see that this type of fact would fit best in paragraph 3. Therefore (C) is incorrect. Paragraph 5 begins: “Another way to tell that a fish is resting is to watch how it reacts to things that happen to it. When a fish is resting, it will respond much more slowly.” As the paragraph continues, the author explains an experiment where scientists gave zebrafish electric shocks while they were asleep and while they were awake. The author then explains that you can try a similar experiment at home by giving food to your pet fish when it looks like it is resting. This paragraph is about how resting fish respond less quickly to things that happen to them. The information in the question is a specific example of a way you can tell that a fish is sleeping just by looking at it. Based on the above information, we can see that this type of fact would fit best in paragraph 3. Therefore (D) is incorrect.