READTHEORY *Reading and Writing, Improved.*

Name _____

Date _____

Surviving On Blood

Fleas are perfectly designed by nature to survive on the blood, and only the blood, of other animals. Fleas are ideally equipped to do what they do, making them very difficult to defeat.

The body of the flea is extremely hardy and well-suited for its job. A flea has a very hard exoskeleton, which means its body is covered by a tough, tile-like plate called a sclerite. Because of these plates, fleas are almost impossible to squish. The exoskeletons of fleas are also waterproof and shock-resistant, and therefore fleas are highly resistant to the sprays and chemicals used to kill them.

Little spines are attached to this plate. The spines lie flat against the flea's thin, narrow body as the flea scurries through an animal's fur in search of food. However, if anything (like fingers or a self-grooming pet) tries to pull a flea off through the hair coat, these spines will extend and stick to the fur like Velcro.

Fleas are some of the best jumpers in the natural world. A flea can jump seven inches, or 150 times its own length, either vertically or horizontally. An equivalent jump for a person would be 555 feet, the height of the Washington Monument. Fleas can jump 30,000 times in a row without stopping, and they are able to accelerate through the air at an incredibly high rate—a rate which is over ten times what humans can withstand in an airplane.

Fleas have very long rear legs with huge thigh muscles and multiple joints. When they get ready to jump, they fold their long legs up and crouch like a runner on a starting block. Several of their joints contain a protein called resilin, which helps catapult fleas into the air as they jump, similar to the way a rubber band provides momentum to a slingshot. Outward facing claws on the bottom of their legs grip anything they touch when they land.

The adult female flea mates after her first blood meal and begins producing eggs in just 1 to 2 days. One flea can lay up to 50 eggs in one day and over 2,000 in her lifetime. Flea eggs can be seen with the naked eye, but they are about the size of a grain of salt. Shortly after being laid, the eggs begin to transform into cocoons. In the cocoon state, fleas are fully developed adults, and will hatch immediately if conditions are favorable. Fleas can detect warmth, movement, and carbon dioxide in exhaled breath, and these three factors stimulate them to emerge as new adults. If the flea does not detect appropriate conditions, it can remain dormant in the cocoon state for extended periods. Under ideal conditions, the entire life cycle may only take 3 weeks, so in no time at all, pets and homes can become infested.

Because of these characteristics, fleas are intimidating opponents. The best way to control fleas, therefore, is to take steps to prevent an infestation from ever occurring

1) The primary purpose of the passage is to

A. provide information about the flea's reproductive process

B. compare fleas to other members of the animal kingdom

C. relate the problems that can result from a flea infestation

D. explain what makes fleas such effective survivors

2) In paragraph 2, the passage says, "The body of the flea is extremely hardy and well-suited for its job." As used in paragraph 2, which of the following accurately describes something that is **hardy**?

A. The Mockingbird is widely noted for its ability to mimic the songs of other birds.

B. The Loggerhead Turtle is a member of the ancient family Cheloniidae, and appeared about 40 million years ago.

C. The German Shepherd is able to bite with a force of 310 pounds per square inch.

D. The Calendula Marigold is able to withstand extreme heat and is drought resistant.

3) According to the passage, fleas are resistant to sprays and chemicals because they

A. have a waterproof sclerite

B. are excellent jumpers

C. reproduce very rapidly

D. can stick to fur like Velcro

4) According to the passage, fleas are difficult to squish because they have

I. sclerites
II. tough spines
III. resilin in their joints

A. I only

B. I and II only

C. II and III only

D. I, II, and III

5) Based on information in the passage, which of the following statements is true?

A. Fleas extend their little spines if threatened.

B. Fleas have the ability to jump higher than humans.

C. Humans could jump higher if they consume foods containing resilin.

D. The resilin found in fleas is used to make rubber bands.

6) According to the passage, fleas are able to jump

I. with a high rate of acceleration
II. up and down and from side to side
III. 250 times its own height

A. I only

B. I and II only

C. II and III only

D. I, II, and III

7) In paragraph 4, the author mentions the Washington Monument in order to

A. provide factual information about a famous monument

B. illustrate a comparison made between fleas and humans

C. clarify a point made regarding fleas and acceleration

D. demonstrate the superiority of fleas over humans

8) Why do you think it is important for a flea to be able to jump so high? Why do you think it is important for fleas to lay so many eggs? Explain your answers.

Answers and Explanations

1) D
Core Standard: Integration of Knowledge

In paragraph 1, we learn that “fleas are ideally equipped to do what they do, making them very difficult to defeat.” In paragraph 2 the author explains why fleas are hard to squish and why they resist so many sprays designed to kill them. In paragraphs 3-6, the author explains what makes fleas so difficult to get rid of, both in terms of their physical characteristics and the way they reproduce. In the last paragraph, the author calls fleas “intimidating opponents” and suggests that preventing an infestation is easier that getting rid of an infestation. From this we can understand that the primary purpose of the passage is to explain what makes fleas such effective survivors. Therefore **(D)** is correct.

Although the passage does provide information about the flea's reproductive process, this is only part of the passage. The passage also provides information about the physical characteristics and life cycle of a flea. These details are all intended to support the primary purpose of the passage, which is to explain what makes fleas such effective survivors. Because it is too narrow in scope, **(A)** is incorrect.

In paragraph 1, the author briefly compares a flea to “a shark in the water or a wolf in the woods.” Later the author says that fleas “are some of the best jumpers in the natural world.” However, the author does not expand on these comments. Rather, the bulk of the passage is used to explain what makes fleas such effective survivors. Because these comparisons are only minor details in the passage, we can understand that **(B)** is incorrect.

The passage does not provide information about the problems that can result from a flea infestation, so **(C)** is incorrect.

2) D
Core Standard: Craft and Structure

In paragraph 2, the author writes, "The body of the flea is extremely hardy and well-suited for its job." The author continues to describe the flea's body using words like "very hard," "tough," "waterproof," and "shock-resistant." This lets us know that something hardy must be very strong, durable, or robust. Since the Calendula Marigold is able to withstand extreme heat and is drought resistant, this lets us know that it accurately fits this description. Therefore **(D)** is correct.

The Mockingbird may accurately be described as unique or talented, but not hardy. This means **(A)** is incorrect.

The Loggerhead Turtle may accurately be described as old or ancient, but not hardy. This means **(B)** is incorrect.

The German shepherd may accurately be described as powerful or dangerous, but not hardy. This means **(C)** is incorrect.

3) A
Core Standard: Key Ideas and Details

In paragraph 2, we learn that “a flea has a very hard exoskeleton, which means its body is covered by a tough, tile-like plate called a sclerite.” From this we can understand that, on a flea, a sclerite forms the exoskeleton. Later in paragraph 2, the author says that “the exoskeletons of fleas are also waterproof and shock-resistant, and therefore fleas are highly resistant to the sprays and chemicals used to kill them.” Since we know that the exoskeleton on a flea is called a sclerite, we can understand that the sclerite is waterproof, which makes fleas resistant to sprays and chemicals.

Therefore **(A)** is correct.

The other choices all involve characteristics of fleas mentioned in the passage, but none of them should lead us to believe that fleas are resistant to chemicals. Therefore **(B)**, **(C)**, and **(D)** are incorrect.

4) A
Core Standard: Key Ideas and Details

In paragraph 2, we learn that “a flea has a very hard exoskeleton, which means its body is covered by a tough, tile-like plate called a sclerite. Because of these plates, fleas are almost impossible to squish.” From this we can understand that the sclerite makes a flea difficult to squish. This supports **option (I)**.

In paragraph 3, we learn that fleas do have spines attached to the sclerite, but these spines make a flea difficult to pull off, not difficult to squish. This eliminates **option (II)**.

In paragraph 5, we learn that fleas have a protein in their joints called resilin, “which helps catapult fleas into the air as they jump.” From this we can understand that resilin helps fleas jump, but it does not make them difficult to squish. This eliminates **option (III)**.

Therefore **(A)** is correct.

5) A
Core Standard: Integration of Knowledge

In paragraph 3, we learn that fleas have little spines that normally lie flat, but “if anything (like fingers or a self-grooming pet) tries to pull a flea off through the hair coat, these spines will extend and stick to the fur like Velcro.” From this we can understand that if a flea is threatened by something trying to remove it, it will extend its spines in order to stick to the fur. This means that **(A)** is correct.

In paragraph 4, we learn that “a flea can jump seven inches, or 150 times its own length.” This means that fleas are able to jump higher *in proportion to their body sizes* than humans are, but fleas can only jump 7 inches. A human can jump higher than 7 inches, so **(B)** is incorrect.

There is no reference in the passage to humans consuming resilin, so **(C)** is incorrect.

In paragraph 5, we learn that resilin “helps catapult fleas into the air as they jump, similar to the way a rubber band provides momentum to a slingshot.” This means the resilin found in fleas’ joints helps them spring in a way similar to rubber bands, but the passage does not state that rubber bands contain resilin. Therefore **(D)** is incorrect.

6) B
Core Standard: Key Ideas and Details

To locate where the author discusses the flea's ability to jump, it helps to scan the topics sentences of each paragraph. The topics sentence of paragraph 4 is: "Fleas are some of the best jumpers in the natural world." This lets us know that the author plans to discuss the flea's ability to jump in this paragraph.

In paragraph 4, we learn that “fleas are able to accelerate through the air at an incredibly high rate—a rate which is over ten times what humans can withstand in an airplane.” From this we can understand that fleas are able to jump with a high rate of acceleration. This supports **option (I)**.

Also in paragraph 4, we learn that fleas are able to jump “horizontally and vertically.” From this we can understand that fleas can jump up and down and from side to side. This supports **option (II)**.

In paragraph 4, the author writes that a flea can jump "150 times its own height." The author does not state that a flea can jump 250 times its own height. This eliminates **option (III)**.
Therefore **(B)** is correct.

7) B
Core Standard: Integration of Knowledge

In paragraph 4, the author writes, “A flea can jump seven inches, or 150 times its own length….An equivalent jump for a person would be 555 feet, the height of the Washington Monument.” The author uses the example of a human jumping the height of the Washington Monument to compare a human’s ability to jump with that of a flea. This example shows why the flea’s ability to jump 150 times its own length is so amazing. This means the mention of the Washington Monument illustrates a comparison between fleas and humans. Therefore **(B)** is correct.

The author mentions the Washington Monument to illustrate a comparison between fleas and humans. The author does not provide factual information about the monument itself; it is only used to further our understanding of fleas. Therefore **(A)** is incorrect.

The author's discussion of fleas and acceleration is unrelated to his or her discussion of the flea's ability to jump, so **(C)** is incorrect.

Although in proportion to its body size a flea can jump higher than a human can, this fact does not necessarily demonstrate the superiority of fleas over humans. This means **(D)** is incorrect.