Informational Reading Comprehension

IMITATING NATURE

Read the text below, and then answer the questions that follow.

1 Picture this: A Swiss engineer examines sticky burrs as he removes them from his dog's fur after a walk in the woods. A Japanese engineer notes a kingfisher bird's **seamless** dive into water to catch prey. American scientists marvel at a gecko's gravity-defying ability to climb up walls and scamper across the ceiling. Each of these observations have inspired different inventions and are all examples of a scientific practice called **biomimicry**. In biomimicry, scientists and engineers closely examine and imitate aspects of the natural world in order to solve human problems.

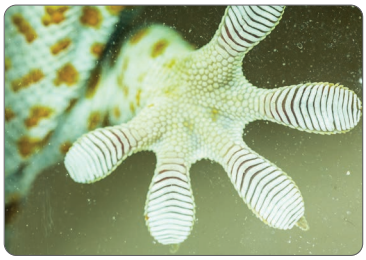
The hooked barbs of the burdock seed's casing (above) inspired George de Mestral's hook-and-loop technology (below).

2 For example, George de Mestral, the Swiss engineer who studied the burrs he plucked from his dog's fur, pondered how the sticky seeds could so effectively attach to fur and clothing. Upon further observation, he noticed that the seed casings had microscopic hooked barbs that would latch onto fibers. That was in 1941. Over the next few decades, de Mestral developed hook-and-loop technology (under the brand name VELCRO®) in which one strip had thousands of tiny hooks—like the ones on those burrs—and the other strip had thousands of soft loops for the hooks to catch upon. Just like that, a new way to fasten materials together was born.

3 Another observer of nature solved a very different problem: train noise. Japan had developed high-speed trains—known in English as "bullet trains"—in the 1960s. However, when the trains emerged from tunnels at over 100 miles per hour, they caused a booming noise that disturbed nearby residents and wildlife. In the early 1990s, Eiji Nakatsu was in charge of making bullet trains even faster and more efficient. But to do this, he had to find a way to make the trains quieter without making them slower and without using more energy. Luckily, Nakatsu was an avid birdwatcher, and he was able to apply some of his observations to solve the issue of train noise. He had observed kingfishers diving rapidly through the air and into water without causing much of a splash. This indicated that the bird's beak had low resistance when entering the water, so Nakatsu suggested shaping the front of bullet trains like the beak and head of the kingfisher. His idea worked, and the newly shaped trains could swiftly fly in and out of tunnels—minus the boom!

The long, thin shape of the kingfisher's beak (above) influenced the shape of the new and improved bullet trains (below).

4 Biomimicry doesn't always happen by chance, though. In fact, teams of scientists from various American universities have been examining gecko feet with the purpose of imitating them in future inventions. So far, they have developed two new technologies based on their observations of the microscopic hairs, called setae, that cover a gecko's feet. One of these inventions will allow humans to climb walls the way that geckos do, while the other is a group of powerful adhesives that can hold heavy objects but are still easy to remove without leaving any stickiness behind.



The stripes on this gecko's toes are actually comprised of thousands of microscopic hairs called *setae*.

5 Nature has long served as a source of exploration and inspiration for humans. The countless possibilities of biomimicry seem to be yet another reason to observe the many wondrous features of the living world.

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Answer the questions about "Imitating Nature."

1. **How does the author introduce the passage?**
   A. by specifying how different animal abilities led to invention
   B. by providing examples of people observing nature
   C. by arguing that people have copied nature for a long time
   D. by starting with the most recent events

2. **Using information from the passage, write a definition for *biomimicry*.**

3. **What is the author's main purpose for writing the passage?**

4. **Reread the first sentence of paragraph 4. Why did the author include this sentence in the article?**
   A. to indicate that paragraph 4 will differ from the previous paragraphs
   B. to give additional details about the previous paragraph
   C. to present an opposing viewpoint from the previous paragraphs
   D. to offer solutions to the problems in the previous paragraphs

5. **Which of the following statements would the author *most likely* agree with?**
   A. Technology will help humans control and surpass nature.
   B. Humans must work to preserve our natural resources.
   C. Imitating nature is the most efficient way to solve problems.
   D. There is much that humans can learn by observing nature.

6. **How might the information in paragraph 3 be presented differently if it were in a memoir written by Eiji Nakatsu?**

7. **What other living things do you think would make a good candidate for biomimicry? Describe what aspects you would imitate and the types of inventions or solutions you would create.**