

## Example

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### The Moho

- 1▶ In the early twentieth century, a seismic event in the Kupa Valley area of Croatia and Slovenia led to a significant discovery concerning the uppermost layers of the Earth. This relatively major earthquake is not primarily noted for the widespread damage it caused over an area of hundreds of kilometers, but rather for the curiosity it inspired in a seismologist from Croatia, Andrija Mohorovicic. Mohorovicic accumulated extensive data from across a large area impacted by the earthquake, which enabled him to determine a separation between the two, topmost layers of the Earth's surface based on the velocity of the seismic waves recorded from the earthquake. This dividing line, named the Mohorovicic discontinuity, or Moho for short, separates the Earth's mantle from its crust, the outermost layer of the Earth.
- 2▶ The deeper layer, the mantle, is estimated to extend nearly 3,000 kilometers from the outer edge of the planet's center almost to the surface, a figure scientists arrived at through various methods of study, including an analysis of seismic waves. While the mantle has been explored through these limited means, the crust, found at the surface of the Earth, is more accessible for examination. Experts have established that the thickness of the crust averages only about 15 to 20 kilometers in depth, in sharp contrast to its width, which extends over tens of thousands of kilometers.
- 3▶ The study of seismic waves has also allowed seismologists and other Earth scientists to calculate the depth of the Moho at various points around the world. What they found is that the thickness of the Moho is not consistent across the width of the layer. Rather, its deepest parts lie beneath areas of the highest altitude and its shallower sections correspond to regions with lower surface elevations. Thus, the Moho ranges in depth from around 70 kilometers below the most imposing mountain ranges to approximately 40 kilometers underneath average continental areas to only about 6 kilometers under the ocean floor.
- 4▶ Though the Moho was a significant discovery for seismologists, the namesake of this division between two of Earth's strata did not set out to discover the line. Initially, Mohorovicic was attempting to solve an issue that was far more crucial to him: the transmission of seismic waves. Mohorovicic assumed that seismic activity progressed through the Earth in relatively straight lines

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of constant velocity, or speed. However, after studying data from the Kupa Valley earthquake, he revised his theory. Instead of moving in straight lines, Mohorovicic concluded that seismic waves curve in a concave manner with increasing velocity the deeper the waves reached.

- 5► The revelation of how seismic waves traveled led to another challenge for the scientist: Why did earthquake waves originating from the same location arrive at the surface of the Earth at different times? The most rational answer was that the interior of the Earth is not homogeneous. At some point, a boundary line separating the layers of the Earth influences the direction and speed of seismic waves, disrupting their continuity. Thus, the Mohorovicic discontinuity, so called for the influence it has on earthquake tremors, was discovered.
- 6► In reality, no one has actually seen the Moho. Scientists acknowledge its existence based on their observations of seismic activity. In the mid-twentieth century, the United States assembled a committee with the proposed idea of drilling through the crust into the Moho, hoping to obtain soil samples from the mantle that would cast light on the Earth's age and formation. It was decided that the ocean floor was the safest, most logical place to bore a hole, since it was determined that the Moho is at its thinnest point under the ocean bed. Over a period of eight years, several holes were drilled below the bottom of the ocean. Unfortunately, none of the holes came close to reaching the Moho, and the project was ultimately abandoned due to its excessive cost.

Look at an example that asks you to choose the best paraphrase of a highlighted sentence in the passage. (See paragraph 1.)



**READING EXERCISE 3:** Study each of the passages and choose the best answers to the questions that follow.

**PASSAGE ONE (Questions 1–4)**

*Paragraph*

**Camouflage**

- 1► Most people recognize camouflage for its utility as military protection. Camouflage is widely used to disguise soldiers on the front lines of a conflict from their opponents, and therefore, save the lives of the soldiers. However, camouflage as protection for soldiers is a relatively recent military innovation, and one that originated through imitating nature.
- 2► Camouflage did not originate with humans; rather, it is a highly varied adaptation copied from nature. As with many ideas that are considered modern and innovative, the concept of camouflage came about from observing how animals acted in the wild. As animals, insects, and other species evolved, weaker, slower prey developed creative means to avoid the predators that chased and killed them. For example, certain animals change their coats, the fur covering their skin, while other species take on the appearance or even sometimes the behavior of their predators to evade capture and death.
- 3► Camouflage is one of the most effective ways for animals to avoid attack in the treeless Arctic. However, the summer and winter landscapes there are so diverse that a single protective color scheme would, of course, prove ineffective in either one season or the other. Thus, many of the inhabitants of the Arctic tundra change their camouflage twice a year. The arctic fox is a clear-cut example of this phenomenon; it sports a brownish-gray coat in the summer which then turns white as cold weather sets in, and the process reverses itself in the springtime. Its brownish-gray coat blends in with the barren tundra landscape in the months without snow, and the white coat naturally blends in with the landscape of the frozen winter tundra.
- 4► Camouflaging falls under three broad categories: mimesis, crypsis, and dazzling, each of which provides a distinct advantage to the creature who has a specific adaptation,



and each of which has evolved within particular species based on their requirements for survival. In mimesis, which is also referred to as "masquerade," the entire animal is disguised as some other creature or object which is of no interest to its enemy, such as when a grasshopper mimics an edible dry leaf. While mimesis is commonly practiced by animals targeted for prey, there are instances when a predator will take advantage of it; for example, the flower mantis, an insect, can successfully replicate the appearance of a certain flower, which allows this predator to draw in and devour its prey. The advantage of mimesis is that it allows animals to hide as they move around in the open.

5▶ Crypsis is a more diverse form of camouflage than mimesis. Crypsis allows the animal to hide by blending in with the background, making it extremely difficult to perceive the animal, especially when it stays still. Many insects and reptiles have this adaptation, changing color to blend into a background of leaves, trunks, or desert rocks. There are several other ways, in addition to changing color to melt into the background, that crypsis works in the wild. Animals such as leopards and giraffes use disruptive patterning, the bold marks on their coat, to blend into the trees of the forest or jungle. Other animals have evolved in such a way that they can eliminate the shadow from around their bodies; shadow is a definite indicator of the presence of an animal or object and may be a key element that predators track. The horned lizard, for instance, has developed a wide and flat body that allows it to lie virtually undetected against the ground of its natural habitat.

6▶ Dazzling is a less common form of camouflage than mimesis and crypsis that allows the animal to hide while in motion. Dazzling resembles the disruptive patterning of crypsis, but serves as a greater advantage to animals while they move. Whereas disruptive pattern may make an animal such as a giraffe more conspicuous when in motion, dazzling creates an illusion of distance and speed, a clear advantage for an animal being chased. Perhaps the most well-known example of an animal that makes use of dazzling is the zebra. It is often fairly simple to spot a single zebra while it is standing still. However, the distinctive black and white stripes can create a tremendous amount of confusion for a hunter pursuing a fleeing herd of zebras. In a large group, the pattern of each zebra's stripes blends in with the stripes of the zebras around it, thus making it difficult for the predator to select a specific target, thus allowing the striped animals a greater chance of escape.

1. Which of the sentences below best expresses the essential information in the highlighted sentence in paragraph 2? *Incorrect* choices change the meaning in important ways or leave out essential information.

- (A) Evolution resulted in strengthening aggressive animals and insects.
- (B) Evolution of vulnerable species resulted in protective adaptations.
- (C) A variety of species developed predatory abilities.
- (D) By observing other species, weak animals and insects developed creative defense strategies.

2. Which of the sentences below best expresses the essential information in the highlighted sentence in paragraph 3? *Incorrect* choices change the meaning in important ways or leave out essential information.

- (A) Opposite conditions in summer and in winter necessitate different protective coloration for Arctic animals.
- (B) The coloration of the summer and winter landscapes in the Arctic fails to protect the Arctic tundra.
- (C) In a single season, protective coloring schemes are ineffective in the treeless Arctic.
- (D) For many animals, a single protective coloring scheme effectively protects them during summer and winter months.

3. Which of the sentences below best expresses the essential information in the highlighted sentence in paragraph 4? *Incorrect* choices change the meaning in important ways or leave out essential information.

- (A) Mimesis is a popular strategy for predators, such as the flower mantises, who can more easily see their prey when they take on the appearance of particular flowers.
- (B) Mimesis is usually used by animals being hunted, but sometimes hunters are able to employ the adaptation, as when the flower mantis disguises itself as a flower to catch its victim.
- (C) Both predators and prey use mimesis as a means of disguise: the flower mantis is the most successful animal at disguising itself to catch its prey.
- (D) Mimesis is generally used by prey to escape their predators; when predators such as the flower mantis use mimesis, the prey trap and eat the hunter.



4. Which of the sentences below best expresses the essential information in the highlighted sentence in paragraph 6? *Incorrect* choices change the meaning in important ways or leave out essential information.

(A) A zebra in a large group is specifically targeted by predators due to its individual pattern of stripes.

(B) Zebras can sometimes escape their pursuers because the pattern of stripes of the herd mixes together and confuses predators.

(C) Predators have difficulty finding a herd of zebras because their stripes blend into the background.

(D) The combined patterns of zebras' stripes can give the predators a greater chance of choosing the ones that can't escape.