

Informational Reading: Central Idea & Textual Evidence



Name: _____ Date: _____

Read the passage carefully, then answer the questions by determining the central idea and citing direct textual evidence.

Oases of the Abyss: Chemosynthesis at Hydrothermal Vents

This is an original practice passage, not a reproduction of a primary source. Read the answer explanations as interpretations of the provided text.

For centuries, marine biologists believed that all life on Earth fundamentally depended on sunlight and photosynthesis. In 1977, however, oceanographers aboard the submersible Alvin descended over 8,000 feet into the Galápagos Rift and made a breathtaking discovery: sprawling communities of giant tube worms, ghost-white crabs, and clams thriving in pitch-black water around boiling geothermal chimneys called hydrothermal vents.

Rather than capturing sunlight, these deep-sea organisms rely on chemosynthesis. Specialized bacteria absorb hydrogen sulfide—a toxic chemical spewing from the Earth's crust—and oxidize it to generate chemical sugars. These microscopic microbes form the foundational base of an entire alien-like food web miles beneath the reach of the Sun, completely revolutionizing humanity's understanding of where life can survive in the cosmos.

1. Which statement best captures the CENTRAL IDEA of the informational text?

- A. Submersible submarines like the Alvin require specialized hulls to withstand ocean pressure.
- B. The discovery of hydrothermal vent ecosystems revealed that thriving life can exist without sunlight through chemosynthesis.
- C. Giant tube worms and ghost crabs are the most dangerous predators in the deep ocean.
- D. Hydrogen sulfide is a dangerous volcanic compound that poisons all marine species.

2. Which sentence from the text provides the STRONGEST textual evidence for how energy enters this deep-sea food web?

- A. 'For centuries, marine biologists believed that all life on Earth fundamentally depended on sunlight...'
- B. 'Specialized bacteria absorb hydrogen sulfide... and oxidize it to generate chemical sugars.'
- C. 'In 1977, oceanographers aboard the submersible Alvin descended over 8,000 feet into the Galápagos Rift...'
- D. '...sprawling communities of giant tube worms, ghost-white crabs, and clams thriving in pitch-black water...'

3. Based on paragraph 2, what can the reader INFER regarding scientific searches for extraterrestrial life on icy moons like Europa or Enceladus?

- A. Life can only exist on worlds that receive direct, intense solar radiation.
- B. Living organisms could potentially thrive in dark subsurface oceans warmed by geothermal heat.
- C. Microorganisms cannot survive unless surface trees and plants produce oxygen first.
- D. Submersible craft will never be useful for planetary space exploration.