

Name: _____ Date: _____

Invisible Frontiers: The 8th Grade Extremophile & Microbe Expedition

How do life forms survive in the most hostile environments on Earth? Analyze metabolic diversity and microscopic structures in this conceptual challenge.

1. A team of researchers discovers a microorganism in a volcanic vent that lacks a nucleus and possesses a cell wall without peptidoglycan. Which domain does this organism likely belong to?

- A. Eukarya
- B. Archaea
- C. Bacteria
- D. Protista

2. Bacteriophages are specialized viruses that infect and replicate specifically within bacterial cells.

- A. True
- B. False

3. During the process of _____, some soil-dwelling bacteria convert atmospheric nitrogen into a form that plants can absorb.

- A. Photosynthesis
- B. Nitrogen Fixation
- C. Transpiration
- D. Decomposition

4. When observing a water sample from a local salt lake, you find a unicellular organism moving via pseudopods. How should this organism be categorized?

- A. A colonial alga
- B. A filamentous fungus
- C. A protozoan
- D. A non-living virus

5. All microbes are pathogenic, meaning they are primarily designed to cause disease in humans and animals.

- A. True
- B. False

6. Scientists use _____ to view internal structures of a virus, as these entities are too small to be resolved by visible light.

- A. Compound Light Microscopes
- B. Stereomicroscopes
- C. Electron Microscopes
- D. Hand Lenses

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7. In an industrial setting, a biologist utilizes *Aspergillus niger* to produce citric acid. *Aspergillus* belongs to which group of microorganisms?

- A. Archaea
- B. Bacteria
- C. Fungi
- D. Viruses

8. Cyanobacteria are unique among prokaryotes because they possess the ability to perform _____.

- A. Fermentation
- B. Endocytosis
- C. Photosynthesis
- D. Binary Fission

9. Microorganisms classified as 'obligate anaerobes' can only survive in environments where oxygen is present.

- A. True
- B. False

10. A scientist is testing a new antibiotic. They notice the drug prevents the formation of cross-links in peptidoglycan. Which of the following would be most affected by this drug?

- A. Yeast cells
- B. Influenza particles
- C. Gram-positive bacteria
- D. Amoebas