

Name: _____ Date: _____

Unseen Warriors vs. Deep Space: The 6th Grade Microbe Challenge

Evaluate how extremophiles might survive on Europa and analyze microbial interactions in this 10-question high-level diagnostic.

1. If an astrobiologist discovers a single-celled organism near a hydrothermal vent on the ocean floor that lacks a nucleus and possesses a unique cell membrane structure, how should it be classified?

- A. Eukaryotic Protozoa
- B. Archaea
- C. Multicellular Fungi
- D. Non-living Virus

2. While bacteria are living organisms that can reproduce independently, _____ require a biological host to replicate their genetic material.

- A. Cyanobacteria
- B. Bacteriophages
- C. Diatoms
- D. Amoebas

3. True or False: In a forest ecosystem, microscopic fungi play a role as primary producers by converting sunlight into chemical energy.

- A. True
- B. False

4. Which piece of evidence would most strongly support the argument that a specific microbe is an autotroph?

- A. The presence of flagella for movement
- B. The consumption of smaller bacteria
- C. The detection of chloroplasts or chlorophyll
- D. A thick peptidoglycan cell wall

5. A scientist observing a sample of pond water notices an organism using small, hair-like projections called _____ to create water currents for feeding.

- A. Pseudopods
- B. Cilia
- C. Hyphae
- D. Capsules

6. True or False: Antibiotics are an effective treatment for eliminating a sickness caused by the Tobacco Mosaic Virus.

- A. True

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B. False

7. In the nitrogen cycle, certain soil bacteria perform 'nitrogen fixation.' Why is this process critical for the survival of animals in that ecosystem?

- A. It removes toxic oxygen from the atmosphere.
- B. It converts nitrogen into a form plants can use to build proteins.
- C. It allows bacteria to move faster through the soil.
- D. It breaks down sugar to release carbon dioxide.

8. A mutation occurs in a population of Dictyostelium (cellular slime mold) that prevents individual cells from signaling each other. What is the most likely consequence?

- A. The cells will immediately become photosynthetic.
- B. The cells will fail to aggregate into a multicellular 'slug'.
- C. The cells will turn into a viral colony.
- D. The cells will grow a protective chitin shell.

9. Unlike prokaryotes, eukaryotic microorganisms such as _____ contain a membrane-bound nucleus that houses their DNA.

- A. E. coli
- B. Thermophiles
- C. Dinoflagellates
- D. Methanogens

10. True or False: Some species of bacteria are used in 'bioremediation' to clean up oil spills because they can metabolize hydrocarbons.

- A. True
- B. False