

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Taxonomic Tailgate: 9th Grade Biodiversity Buffet Quiz

Decode the complexities of phylogenetic lineages and metabolic pathways to categorize organisms in this advanced molecular phylogeny challenge.

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**1. A newly discovered organism lacks a nucleus and possesses membrane lipids with branched hydrocarbons linked to glycerol by ether bonds. In which domain should this organism be categorized?**

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

**2. In the cladistic approach to classification, a \_\_\_\_\_ group consists of an ancestral species and all of its descendants.**

- A. Paraphyletic
- B. Monophyletic
- C. Polyphyletic
- D. Analogous

**3. Horizontal gene transfer (HGT) complicates the 'Tree of Life' model because it involves the movement of genetic material between different species rather than just from parent to offspring.**

- A. True
- B. False

**4. Which of the following biochemical characteristics would definitely exclude an organism from Kingdom Fungi?**

- A. Being a multicellular eukaryote
- B. Using absorptive heterotrophy
- C. Cell walls composed mainly of cellulose
- D. Reproduction via haploid spores

**5. If you are using the biological species concept, the primary criterion for classifying two populations as the same species is \_\_\_\_\_.**

- A. Morphological similarity
- B. Niche overlap
- C. Reproductive compatibility
- D. DNA sequence identity

**6. When comparing the classification of a Redwood tree and a Moss, at which taxonomic level do they first diverge?**

- A. Kingdom

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- B. Phylum
- C. Class
- D. Domain

**7. The term 'Protista' is considered a valid monophyletic kingdom in modern phylogenetic systematics.**

- A. True
- B. False

**8. To determine the evolutionary relationships between very distantly related organisms, such as a human and a bacterium, scientists compare sequences of \_\_\_\_.**

- A. Mitochondrial DNA
- B. Ribosomal RNA (rRNA)
- C. Hemoglobin proteins
- D. Chloroplast genes

**9. An organism is found in a volcanic vent. It is unicellular, lacks a nuclear envelope, and its RNA polymerase is more similar to Eukaryotes than to Bacteria. It should be classified as:**

- A. A thermophilic Bacterium
- B. An extremophilic Archaeon
- C. A primitive Protist
- D. A unicellular Fungus

**10. In binomial nomenclature, the species epithet is always capitalized and can stand alone to identify the organism.**

- A. True
- B. False