

Name: _____ Date: _____

Answer Key: Jurassic World: Advanced Taxonomy & Phylogeny Finals for Seniors

Go beyond simple naming conventions to identify structural differences between Eukarya and Prokarya in this formative assessment on biological organization.

1. While analyzing a microscopic sample from a deep-sea hydrothermal vent, you find a unicellular organism that lacks a nucleus and possesses membrane lipids with ether-linked branched chains. To which domain does this organism belong?

Answer: C) Archaea

Archaea are characterized by unique membrane chemistry, such as ether linkages, which allow them to survive in extreme environments where Bacteria (ester-linked) cannot.

2. The use of binomial nomenclature ensures that a single organism, such as the North American cougar, is recognized by the same scientific name (*Puma concolor*) globally regardless of regional common names.

Answer: A) True

Binomial nomenclature provides a universal, standardized language for scientists to identify species without the confusion of local naming variations.

3. An organism that is multicellular, eukaryotic, and lacks a cell wall while obtaining nutrients through ingestion belongs to the Kingdom _____.

Answer: B) Animalia

Kingdom Animalia is distinct from Fungi (which have chitin walls and absorb nutrients) and Plantae (which have cellulose walls and photosynthesize) due to its lack of cell walls and ingestive heterotrophy.

4. In the modern taxonomic hierarchy, which of the following levels contains the greatest diversity of genetic variation and the largest number of organisms?

Answer: D) Kingdom

Taxonomy is a nested hierarchy; the Kingdom level is broader than Phylum, Class, or Genus, and therefore encompasses more organisms and diversity.

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5. Organisms classified within the Kingdom Fungi are primary producers that utilize chlorophyll to synthesize glucose from sunlight.

Answer: B) False

Fungi are heterotrophs that obtain energy through absorption, not photosynthesis; they lack chlorophyll and do not function as primary producers.

6. The scientific name for the common baker's yeast is *Saccharomyces cerevisiae*. In this name, 'Saccharomyces' represents the _____ level of classification.

Answer: C) Genus

In binomial nomenclature, the first word is the genus (capitalized) and the second word is the specific epithet (lowercase).

7. Which of the following is the most accurate reason why the Kingdom Protista is often referred to as a 'taxonomic drawer' or catch-all group?

Answer: B) It includes any eukaryote that does not fit into plants, animals, or fungi.

Protista is a diverse group of eukaryotes that lack the shared derived characteristics of the more specialized multicellular kingdoms.

8. According to the hierarchical system of classification, two organisms belonging to the same 'Order' must also belong to the same 'Class'.

Answer: A) True

Because the hierarchy is nested, if two organisms share a lower (more specific) level like Order, they must also share all the higher (more broad) levels above it.

9. Cyanobacteria are unique because, although they are prokaryotic, they perform oxygenic photosynthesis. They are classified under the Domain _____.

Answer: D) Bacteria

Cyanobacteria are true bacteria (Domain Bacteria) because they contain peptidoglycan in their cell walls and lack a membrane-bound nucleus.

10. When comparing a redwood tree (Plantae) and a puffball mushroom (Fungi), what is a fundamental difference in their cellular composition?

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Answer: B) Redwoods have cell walls made of cellulose; mushrooms have cell walls of chitin.

The composition of the cell wall (cellulose for plants vs. chitin for fungi) is a primary diagnostic feature used to differentiate these two kingdoms.