

Name: _____ Date: _____

Answer Key: The Mystery of the Microbe Colony: A 5th Grade Inquiry Quiz

Aspiring biologists will identify variables within bioluminescence studies and synthesize data to refine hypotheses about deep-sea environments.

1. A marine biologist notices that deep-sea fish glow brighter in colder currents. This observation leads to the 'Question' phase. Which is the most scientifically sound question to advance this study?

Answer: B) Does water temperature affect the rate of chemical reactions in bioluminescent bacteria?

A high-level scientific question must be specific, measurable, and directly linked to the observation regarding temperature and light intensity.

2. In an experiment testing how different wing shapes affect the flight distance of a paper airplane, the specific shape of the wing is considered the _____ variable.

Answer: C) Independent

The independent variable is the factor that the scientist intentionally changes to observe its effects.

3. If an experimental result does not support the original hypothesis, the experiment is considered a failure and the data should be discarded.

Answer: B) False

Refuting a hypothesis is a vital part of science; it provides evidence that the explanation was incorrect and leads to the formation of new, more accurate hypotheses.

4. Dr. Aris is studying why certain desert cacti bloom only at night. After researching, she thinks it is to attract nocturnal bats. What is her next logical step in the scientific method?

Answer: C) Formulate a testable hypothesis and design a controlled experiment.

After research, a scientist must define a clear hypothesis that can be tested through a structured experiment.

5. To ensure that an experiment's results are reliable and not due to chance, a scientist should perform multiple _____.

Answer: B) Trials

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Repeating trials helps verify that the data is consistent and reduces the impact of accidental errors or outliers.

6. Which of these is a synthesis of data rather than just a simple observation?

Answer: C) Across three trials, the average growth rate increased by 20% when nitrogen was added.

Synthesis involves looking at multiple data points, calculating averages, or identifying trends to understand the bigger picture.

7. A 'Control Group' is the part of an experiment that is kept under normal conditions to serve as a baseline for comparison.

Answer: A) True

The control group allows scientists to see what happens when the independent variable is not applied, proving that the results are caused by the change they made.

8. Imagine you are investigating why a brand of biodegradable plastic breaks down faster in soil than in water. Which piece of background research would be MOST helpful?

Answer: C) Studies on the different types of bacteria found in soil versus water.

Relevant research must focus on the mechanisms (like bacteria) that actually cause the decomposition being studied.

9. When a scientist creates a graph to show the relationship between 'Hours of Sleep' and 'Test Scores,' they are engaging in the _____ stage.

Answer: B) Data Analysis

Data analysis involves organizing raw numbers into visual formats like graphs to find patterns or correlations.

10. Peer review (Communication) is only necessary if a scientist discovers something that has never been seen before.

Answer: B) False

All scientific findings should be communicated and reviewed by peers to ensure the methods were sound and the conclusions are valid, regardless of how 'new' the discovery is.