Name: _____ **Date:** _____

Answer Key: The Mystery of the Wilting Fern: A 4th Grave Inquiry Quiz

Evaluate 10 complex scenarios requiring students to identify variables, analyze conflicting data sets, and refine hypotheses in a rigorous scientific investigation.

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1. An oceanographer notices that bioluminescent algae glow brighter in colder water. If they want to perform an experiment to prove why, which of these is the most effective 'Independent Variable' to isolate?

Answer: B) The exact temperature of the water samples

The independent variable is the factor the scientist deliberately changes. Since the observation involves temperature, changing the water temperature is the variable being tested.

2. Maya is testing which birdseed attracts the most Northern Cardinals. She must keep the height of the bird feeders the same. This 'unchanging' factor is known as a _____.

Answer: C) Controlled Variable

Controlled variables are quantities that a scientist wants to remain constant to ensure the test is fair and results are due only to the independent variable.

3. If an experiment's results do not support the original hypothesis, the entire experiment is considered a failure and the data should be discarded.

Answer: B) False

In science, a 'disproven' hypothesis is still a success because it provides new information and helps scientists refine their ideas for future tests.

4. Which of these represents a 'Quantitative' observation that a geologist might record while studying a canyon wall?

Answer: C) The sediment layer is exactly 4.2 meters thick

Quantitative observations involve numbers, measurements, or quantities. '4.2 meters' is a precise numerical measurement.

5. A scientist writes: 'If I increase the amount of zinc in the battery, then the flashlight will stay lit longer.' This statement is a(n) _____.

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Answer: D) Hypothesis

A hypothesis is a testable prediction, often written in an 'If... then...' format, that suggests a relationship between two variables.

6. Scientific 'Communication' only happens after the experiment is completely finished and a conclusion has been reached.

Answer: A) True

Communication is the final step where scientists share their peer-reviewed findings so others can learn from or replicate the work.

7. Leo is studying how different types of bridge shapes hold weight. He builds three bridges: a beam bridge, an arch bridge, and a suspension bridge. Why is it important for him to use the same material (like popsicle sticks) for all three?

Answer: A) To make sure the results are caused by the shape, not the material

By keeping the material the same, he ensures a 'fair test' where only the independent variable (bridge shape) affects the dependent variable (weight held).

8. After collecting data on how fast ice melts in different liquids, Dr. Aris looks for patterns in the numbers. This step is called Data _____.

Answer: B) Analysis

Data Analysis is the step where scientists organize their recordings into charts or graphs to see what the numbers are telling them.

9. An 'inference' is the same thing as a direct 'observation.'

Answer: B) False

An observation is what you see, feel, or hear. An inference is an educated guess based on those observations (e.g., seeing wet grass is an observation; inferring it rained is an inference).

10. A team of researchers wants to know if a specific type of soil helps sunflowers grow taller. They plant 50 seeds in the new soil and 50 seeds in regular garden soil. What is the group in the 'regular garden soil' called?

Answer: C) The Control Group

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The control group is the standard to which comparisons are made in an experiment. It does not receive the 'treatment' being tested (the new soil).