

Name: _____ Date: _____

The Forensic Investigator's Seventh Grade Inquiry Expedition

Aspiring scientists apply rigorous experimental design and variable control across 10 challenges modeled after real-life laboratory and field research scenarios.

1. A marine biologist notices that coral bleaching is more prevalent in areas with high boat traffic. Before designing an experiment, which step is essential to ensure the study is grounded in existing scientific knowledge?

- A. Formulating a final conclusion about boat engines.
- B. Conducting a literature review of peer-reviewed studies on coral stressors.
- C. Immediately banning all boats from the reef area.
- D. Changing the independent variable to water temperature.

2. In a controlled experiment testing how different wavelengths of light affect the rate of photosynthesis in Elodea plants, the 'rate of photosynthesis' represents the _____.

- A. Independent Variable
- B. Control Group
- C. Dependent Variable
- D. Constant

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

- A. True
- B. False

4. Which of the following is the most scientifically sound hypothesis regarding the effect of urban noise on avian communication?

- A. Birds hate loud cities and wish they lived in the quiet country.
- B. Urban noise is loud, so birds probably have to sing louder.
- C. If ambient noise levels increase, then city birds will sing at higher frequencies to be heard.
- D. Birds in the city sing differently than birds in the forest because of the buildings.

5. To ensure that the results of a study on soil pH and earthworm activity are caused only by the pH levels, a scientist must keep the soil moisture and temperature _____.

- A. Variable
- B. Dependent
- C. Unpredictable
- D. Constant

6. A scientific theory is just an educated guess that has not yet been tested by an experiment.

- A. True

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B. False

7. An engineer is testing a new composite material for bridge cables. After three trials, the material snaps earlier than expected. What is the most logical next step in her inquiry?

- A. Report that the material is perfect and ignore the snaps.
- B. Analyze the breaking points to identify a pattern and revise the design.
- C. Immediately build the bridge to see if it happens in real life.
- D. Wait for another engineer to solve the problem.

8. A researcher is studying the efficacy of a new vaccine. Group A receives the vaccine, while Group B receives a saline injection (placebo). Group B serves as the _____.

- A. Experimental Group
- B. Control Group
- C. Hypothesis
- D. Conclusion

9. Quantitative data involves numerical measurements, while qualitative data involves descriptive observations.

- A. True
- B. False

10. Why is 'Communication' considered a final but continuous step in the scientific method?

- A. Because scientists like to brag about their discoveries.
- B. To allow for peer review and the replication of results by other scientists.
- C. To make sure the scientist gets paid for their work.
- D. Because it is required by law to post every experiment online.