

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

## Answer Key: Neon Labs: A 6th Grade Scientific Method Logic Quest

Students analyze experimental variables and evidence-based reasoning to solve real-world laboratory mysteries through critical thinking and data interpretation.

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**1. A chemist observes that a specific alloy glows when exposed to UV light. Before starting an experiment, she reads journals about phosphorescence. Which stage of the scientific method is this?**

**Answer:** C) Background research

Research involves gathering existing knowledge from reliable sources to inform the direction of a new investigation.

**2. In a controlled experiment, a scientist should change multiple independent variables at the same time to see how they interact.**

**Answer:** B) False

To ensure validity, only one independent variable should be changed at a time so the researcher knows exactly what caused the observed result.

**3. Marcus claims that 'If I add more electrolytes to the battery, then the light bulb will burn brighter.' In this statement, 'light bulb brightness' is the \_\_\_\_\_ variable.**

**Answer:** B) Dependent

The dependent variable is the factor being measured or observed; it changes in response to the manipulation of the independent variable.

**4. A marine biologist notices that coral bleaching occurs more frequently in areas with high boat traffic. What is the most logical next step in the scientific method?**

**Answer:** B) Develop a testable hypothesis

After making an observation and identifying a problem, a scientist must propose a testable explanation (hypothesis) before conducting experiments.

**5. When a scientist shares her data with other experts to check for errors or bias before publication, this process is known as \_\_\_\_\_.**

**Answer:** A) Peer review

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Peer review is a critical part of communication in science, ensuring that findings are reliable and the methods used were sound.

**6. A hypothesis is only useful to a scientist if the experimental data proves it to be absolutely correct.**

**Answer:** B) False

An incorrect hypothesis is still valuable because it rules out a possibility and leads to new questions and further investigation.

**7. Which of these is a qualitative observation rather than a quantitative measurement?**

**Answer:** A) The liquid turned a deep purple color

Qualitative observations describe qualities or characteristics (like color or texture) rather than numerical values.

**8. To ensure an experiment is fair, the factors that are kept exactly the same in both the experimental and control groups are called \_\_\_\_\_.**

**Answer:** C) Constants

Constants (or controlled variables) are essential to prevent outside factors from influencing the results of the experiment.

**9. If an experiment's results do not support the original hypothesis, what should the scientist do next?**

**Answer:** C) Refine the hypothesis and re-test

Science is an iterative process; when results refute a hypothesis, scientists use that new information to form a better, more accurate hypothesis.

**10. The 'Conclusion' step of the scientific method is where a scientist summarizes the findings and explains whether the data supports the hypothesis.**

**Answer:** A) True

The conclusion links the data back to the original question and hypothesis, providing a final synthesis of what was learned.