

Nova's Material Investigation Log

Learning objective: To identify, compare, and group materials based on their physical properties and justify their suitability for specific purposes.

Join Nova the owl in her laboratory! Choose three different objects from your classroom or home. Examine them carefully and use this log to record their properties. Think like a scientist: does the material allow light to pass through? Is it flexible or rigid? Use the word bank to help describe your findings.

Word bank: Transparent · Opaque · Translucent · Flexible · Rigid · Permeable · Waterproof · Durable · Conductive · Insulating

1. Object Identification: Name your chosen object and identify the primary material it is made from (e.g., wood, plastic, metal, glass, fabric). (2 marks)

2. Property Analysis: Describe at least three physical properties of your material. Why do these properties make the material suitable for the object's purpose? (4 marks)

3. Comparison: Compare your object to a different material. If you replaced your object's material with another, what might happen? Justify your answer. (4 marks)

4. Scientific Reasoning: Explain why a raincoat is made from a waterproof material rather than a permeable fabric like cotton. What are the consequences of choosing the wrong material? (3 marks)

5. Material Suitability: If you were designing a new window for a house, why would you choose a transparent material? Explain the benefits and drawbacks. (3 marks)

6. Greater Depth Challenge: Imagine a material that is both flexible and waterproof. Propose an original invention you could create using this material and explain why it would be useful. (4 marks)

Extension challenge: Design a 'Material Test' experiment. How could you test if a material is waterproof or durable? Write a step-by-step method for a classmate to follow, including how you would ensure your test is a fair test.