

Nova's Light and Shadow Investigation Log

Learning objective: To identify how light travels, how shadows are formed, and explain the properties of opaque, translucent, and transparent materials.

Use this log to document your scientific findings. Observe how light interacts with different objects around your classroom or home. Remember to use precise scientific vocabulary when explaining your observations to Nova the owl.

Word bank: rectilinear propagation · opaque · translucent · transparent · light source · reflection · shadow · absorb

1. The Light Source: Identify your chosen light source. Explain why this object is classified as a light source rather than a reflective surface. (2 marks)

2. Material Investigation: Select three different materials (e.g., glass, cardboard, tracing paper). Categorise them as opaque, translucent, or transparent and justify your choices. (3 marks)

3. Shadow Formation: Explain the process of how a shadow is created when an opaque object is placed in the path of a light source. (3 marks)

4. Comparative Analysis: Compare how the size of a shadow changes if the object is moved closer to the light source versus further away. Justify your answer using the concept of light rays. (4 marks)

5. Critical Thinking: If you were designing a window for a library where you wanted light to enter but not allow people to see clearly through it, which material property would you choose? Explain why. (3 marks)

6. Hypothesis: What might happen if you used a mirror to reflect light into a darkened room? Predict the path the light would take. (2 marks)

Extension challenge: Design a 'Shadow Theatre' setup. Write a short paragraph justifying the placement of your light source and the choice of materials for your puppets to ensure the shadows are as sharp and distinct as possible.