Year 4 Science Assessment: The Wonders of Light

Learning objective: To assess understanding of light sources, reflection, shadows, and the role of light in seeing objects.

Read each question carefully. Use your scientific knowledge to provide clear and accurate answers. Ensure you use the provided word bank to support your explanations.

Nova the owl is stargazing in the dark forest, while Max the monkey is using a torch to find his missing maths equipment. They notice how light behaves differently depending on the objects it hits. Help them solve these mysteries by answering the questions below.

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

1. Identify two natural light sources and two artificial light sources Nova might see while exploring at night. (4 marks) (4 marks)

2. Max shines his torch at a mirror. Explain what happens to the light rays. Use the term 'reflection' in your answer. (2 marks) (2 marks)

3. Why is it impossible to see in a room that is completely dark? (2 marks) (2 marks)

4. Compare and contrast the properties of an opaque object and a transparent object. How does each affect the path of light? (3 marks) (3 marks)

5. Explain why shadows change size throughout the day. What happens to a shadow if the light source moves closer to the object? (4 marks) (4 marks)

6. Max is testing materials for a new sun-shade. He has a piece of thin tissue paper, a piece of thick cardboard, and a clear glass pane. Justify which material he should use to create the darkest shadow and explain why the tissue paper allows some light to pass through. (5 marks) (5 marks)

7. What might happen if the surfaces of all objects in the world were perfectly smooth and shiny like mirrors? (5 marks) (5 marks)

Draw: In the space below, draw a diagram showing a ray of light travelling from a torch, hitting a mirror, and reflecting onto a wall. Label the 'incident ray' and the 'reflected ray'.

Extension challenge: Total: /25. Imagine you are designing a theatre set. Explain how you would use different materials to create a silhouette effect for the audience. Why is controlling light essential for this effect?