

Year 4 Science Assessment: The Mystery of Materials

Learning objective: To identify, describe, and compare the properties of a variety of everyday materials and understand how they change.

Read each question carefully. Use your scientific knowledge to explain your reasoning. Ensure you use precise vocabulary.

Nova the owl is helping the forest animals choose the best materials to build a new community library. They need to choose materials that are durable, safe, and fit for purpose. Max the monkey is busy testing how different materials react to heat, water, and force.

Word bank: transparent · opaque · translucent · flexible · rigid · permeable · thermal conductor · insulator · reversible · irreversible

1. Nova wants the library windows to let light in, but she doesn't want people outside to see the books clearly. Which property should the window glass have? Explain your choice. (2 marks)

2. Max is designing a handle for a hot metal teapot. Should he choose metal or wood for the handle? Justify your answer using the term 'thermal conductor' or 'insulator'. (3 marks)

3. Identify two materials that are permeable and explain why they would be a poor choice for a roof on the library. (3 marks)

4. Compare and contrast a rubber band and a ceramic plate. Use the words 'flexible' and 'rigid' in your answer. (3 marks)

5. Max melts an ice cube to make a drink, then freezes it again. Is this a reversible or irreversible change? Explain how you know. (4 marks)

6. The animals decide to bake a cake for the library opening. Explain why baking a cake is an example of an irreversible change. What might happen if you tried to turn the cake back into flour and eggs? (5 marks)

7. If the library roof was made of a material that was not solid (like a net), describe how the internal environment of the library would change during a rainstorm. (5 marks)

Draw: Draw a diagram of a 'Super-Umbrella' designed by Kit the fox. Label at least three parts of the umbrella and identify the material used for each part, explaining why that specific material was chosen based on its properties.



Extension challenge: Total: /25. Extension: Nova suggests using a new, sustainable material that is both transparent and a thermal insulator. Justify why this would be the 'perfect' material for a building, and suggest one way we could test its strength.