Nova’s Material Discovery

Learning objective: To identify, describe, and compare the suitability of a variety of everyday materials based on their properties.

Read the passage carefully and answer the questions below using full sentences. Refer back to the text to support your answers.

Nova the barn owl was busy preparing for a stargazing night. She needed to build a shelter that was durable enough to withstand a light breeze, yet clear enough to see the stars. Nova gathered her materials: a piece of thick, woollen fabric, a sheet of transparent plastic, and a smooth metal tray. She tested the plastic and found it was waterproof, making it a perfect roof. However, she noticed the metal tray was a thermal conductor, meaning it felt freezing to the touch when the temperature dropped. Nova decided to use the woollen fabric as a lining because it is a fantastic thermal insulator, keeping the warmth inside her shelter. She avoided using a sponge because it is permeable, which would let the night dew soak through and make her feathers damp. By carefully choosing materials based on their properties—like transparency, texture, and heat conductivity—Nova created the perfect spot to watch the night sky. She learned that every object has a specific purpose depending on what it is made of.

Word bank: properties · transparent · thermal · insulator · conductor · flexible · durable · permeable

1. Which two materials did Nova decide to use for her shelter and why? (2 marks)

2. What does the word 'permeable' mean in the context of the sponge? (2 marks)

3. Why was the metal tray considered unsuitable for the inside of the shelter? (2 marks)

4. Why did Nova choose transparent plastic instead of the woollen fabric for her roof? (2 marks)

5. If you were building a bridge across a small stream, which property would be most important for your material to have? Explain your reasoning. (2 marks)

Draw: Draw and label Nova’s shelter, showing which parts are made of the plastic sheet, the woollen fabric, and the metal tray.

Extension challenge: Research three different materials used in your own home. List them and explain one property for each (e.g., 'Glass is transparent') and why that property is useful for its specific job.