Materials Lab: Designing a Greenhouse with Bea the Honeybee

Learning objective: To identify, explain and justify the suitability of materials based on their properties, such as transparency, thermal insulation, and electrical conductivity.

Bea the Honeybee is designing a new research greenhouse to protect her delicate nectar plants from the unpredictable British weather. Use the drawing area below to design her structure. Use your knowledge of materials to choose the best substances for the roof, the frame, and the base.

Draw: Draw a large, detailed greenhouse in the centre of the page. Include a roof with angled panels, sturdy walls, and a solid base. Sketch Bea the Honeybee hovering near the entrance. Use arrows to point to the different parts of your greenhouse and label them with the specific materials you have chosen (e.g., glass, plastic, wood, or metal). Annotate your drawing with properties from the word bank to show why you chose each material.

Label words: Transparent · Thermal Insulator · Rigid · Waterproof · Durable · Conductive

Steps:

1. Draw a small, clear window on the roof of your greenhouse. Label this material and explain why 'transparency' is an essential property for this part of the design.
2. If Bea wants to use an electric heater inside, why must the frame be made of a material that is a good

electrical insulator? List one suitable material.

3. Label the base of your greenhouse. Why should this material be 'waterproof' and 'durable'?

4. Suggest a material that would be a good 'thermal insulator' for the walls to keep the plants warm at night. Why is this important?

5. If you had to make the greenhouse frame out of a metal, which property of metals would you need to consider to ensure the structure doesn't collapse under its own weight?