Properties and Changes of Materials: Brighter Bulbs

Aim:	Success Criteria:	Resources:
To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic by investigating the best electrical conductors. To compare and group together everyday materials on the basis of their electrical conductivity by investigating the best electrical conductors. I can investigate which electrical conductors make a bulb shine brightest.	I can identify electrical conductors and insulators. I can explain that some materials are better conductors than others. I can carry out an investigation to find the best electrical conductor.	**Lesson Pack** Batteries Bulbs Wires Connectors such as crocodile clips Different metals to test in the circuit - ideas include: copper coin, iron nail, steel spoon, silver jewellery, gold jewellery. Data loggers with light sensors if possible Access to **this clip.**
	Key/New Words: Material, electric, conductor, insulator, resistance, circuit.	**Preparation:** **Conductor and Insulator Cards** per child. Differentiated **Brighter Bulbs Activity Sheet** per child.

Prior Learning: The children will have learnt about electrical conductors and insulators in Year 4.

Learning Sequence

Whole Class	**Electrical Conductors and Insulators:** Recap electrical conductors and insulators from Y4 by watching **this clip**. Ask the children to use their **Conductor and Insulator Cards** to play a game to identify materials as conductors or insulators. Use the pictures of materials on the Lesson Presentation and ask the children to hold up the correct card for each one. Look for children who are successful in identifying the electrical conductors and insulators.	
	Conductors and Resistance: Use the **Lesson Presentation** to explain that different conductors have different levels of resistance, and therefore some materials conduct electricity better than others.	
	Football Floodlights: Share the context of the investigation using the information on the **Lesson Presentation**. Explain that the children should present their recommendations for the best material to use to make the floodlights as bright as possible.	
	Brighter Bulbs: Ask the children to work in groups to investigate the conductivity of different materials. They should set up a simple circuit with a battery and a bulb, and use different metals to complete the circuit. They can either observe the brightness of the bulb with each material, or measure the light levels using a data logging box with a light sensor. They should order the materials on the basis of their conductivity and plan their presentations using their differentiated **Brighter Bulbs Activity Sheet.** The groups could film their presentations or show them to the rest of the class. Look for children who can explain that different materials have different levels of conductivity, and can investigate the best conductor for a purpose. ★ Use the headings, examples and key words to plan their presentations. ★★ Use the headings and examples to plan their presentations. ★★★ Use the headings to plan their presentations.	
Whole Class	**Football Feedback:** Ask the children whether their groups all recommended the same material as the most conductive. Discuss any differences in their results.	

Task*it*

***Answer*it:** Try **this quiz** all about electrical conductors and insulators.

***Create*it:** Make a collage of electrical conductors. Put them in order of conductivity.

***Make*it:** Make a non-fiction book all about materials and their conductivity. Use one page per material and order the pages from least conductive to most conductive.